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IN CASSETTE

SMALL TALK
USER'S MANUAL

VTEK

Part No. 55802
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WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT
EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

PERFORM ALL CABLE CONNECTIONS, SWITCH SETTINGS, AND
OTHER ADJUSTMENTS WITH THE POWER OFF ON BOTH SMALL
TALK AND ANY PERIPHERALS TO WHICH YOU MAY CONNECT IT.

OTHERWISE, DAMAGE TO THE EQUIPMENT AND PERSONAL INJURY
MAY RESULT. REFER ANY OPERATIONAL PROBLEMS TO VTEK.

CURRENCY OF MANUAL

IMPORTANT NOTE: This manual is accurate and up-to-date as of this printing. However, because of the rapid pace of technological advances, slight system modifications may not be reflected in this manual. Therefore, this manual does not constitute a specification of warranty that delivered equipment will conform in every respect to the descriptions contained herein. Supplementary information will be included whenever necessary to explain and update changes affecting equipment operation subsequent to this printing.

DISCLAIMER OF WARRANTY AND LIABILITIES

VTEK makes no warranties, either express or implied, with respect to this manual or with respect to any software provided with or for use on the product described in this manual. All software (programs) are sold and distributed "as is", and VTEK assumes no liability whatsoever for damage caused directly or indirectly by computer equipment or programs, including but not limited to any interruption of service or use, loss of business or anticipatory profits, or consequential damages resulting from the use or operation of SMALL TALK, connected peripherals, or programs used with it. VTEK's sole warranty is with respect to defects in equipment, as described later in the manual.

@1985

NOTE: This manual is included free with each SMALL TALK order. If you purchase this manual and then purchase a SMALL TALK within six months, VTEK will refund or credit what you paid for the manual as well as provide you with an updated copy of the manual with your equipment shipment.

OPERATION OUTSIDE NORTH AMERICA

When SMALL TALK is running on primary power (mains) 60 Hz, 110-120 V with the Smart Charger, there should never be a power problem. However, there may be occasions when SMALL TALK is used in countries where primary power is at 50 Hz and voltage is at 220-240 V. In these cases, it is recommended that a standard Voltage Converter be used to charge SMALL TALK via its Smart Charger. SMALL TALK can operate while the charger is connected in countries where power configurations differ than in North America, but a voltage converter IS REQUIRED.

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Up Line: CTRL-K

T1000 Small Talk Portable Note-Taking Device

SMALL TALK USER'S MANUAL

Section 1: GENERAL INTRODUCTION

Section 1-1: Introduction to SMALL TALK

VTEK is pleased to welcome you to the world of computerized, portable note-taking. SMALL TALK is one of the most revolutionary, innovative technical sensory aids ever developed, and we are sure you will derive many hours of satisfaction and accomplishment with SMALL TALK. SMALL TALK was developed by the Computer Aids Corporation, the leader in mi-cro-computer voice technology, and SMALL TALK is distributed and backed by VTEK, the world's largest manufacturer of sensory aids for blind and visually impaired people. Computer Aids Corporation developed SMALL TALK from the Epson HX-20 personal computer. In addition to this oper-ating manual, VTEK provides manuals prepared by the Epson Company as additional references to SMALL TALK and BASIC programming with SMALL TALK.

SMALL TALK, the computerized, portable, versatile note-taker combines the power of a personal computer with the portability of a calculator. It goes where the work is, operating on batteries or AC power, output-ting information via voice, print, or LCD screen. It is also a user-friendly sensory aid, meaning you need to know nothing about computers to master it. Its portability makes it the ideal note-taker in the classroom, boardroom, conference room, even courtroom. Put it on a desk or on your lap . . . SMALL TALK goes where the work is.

VTEK wants to thank you for choosing SMALL TALK. If you ever have any questions about the operation and performance of your SMALL TALK, please don't hesitate to contact us.

This User's Manual is divided into four major sections. The first three parts are crucial to your fully understanding how to use SMALL TALK. You should read these parts very carefully. The fourth part deals with programming SMALL TALK with the built-in BASIC programming language. Understanding this section is not vital to understanding SMALL TALK, but read it if you are interested. A final section of the manual is de-voted to various appendices which concern warranty information, guaran-tees, and other references.

SMALL TALK is a new product, and because it is a new product, there are likely to be new programs generated by many users. You may contact VTEK or Computer Aids Corporation to determine if additional programs are available. We are certainly interested in any new programs you might develop for SMALL TALK.

Section 1-2: The Manual

As mentioned earlier, everything you need to know about SMALL TALK is con-
tained in the User's Manual. The instructions in the manual are tutorially
styled. By using examples, we'll work along with you as you develop flu-
ency with SMALL TALK.

Section 1-3: The Package

Remove all the materials from SMALL TALK's box. Be sure and save all the
original packing materials for future storage, or in case you ever have
to send your unit back to VTEK for servicing.

Your SMALL TALK should contain the following:

1. SMALL TALK Note-Taker in leatherette carrying case

2. AC Adapter/Wall Charger (Smart Charger)

3. User's Manual

4. Audio Cassette Tapes of the User's Manual

5. Epson HX-20 manuals

6. Post-paid User's Registration/Warranty card

Section 1-4: A Guided Tour of SMALL TALK

Take SMALL TALK out of the case and always hold and carry it with two hands.
Notice the typewriter/computer keyboard. When SMALL TALK is in its operating
position, the keyboard faces you with the extended portion (Expansion Unit) to
the left. This Expansion Unit is an additional attachment to the main unit.
NEVER LIFT OR CARRY SMALL TALK BY THIS END. Always use two hands. (See
Figure 1-1-1)

The Expansion Unit of the cabinet contains SMALL TALK's voice synthesizer and
memory. The upper, top surface of this piece is a grooved speaker grill. In-
side is, of course, the built-in speaker used by the speech synthesizer. The
VOLUME CONTROL is located along the left edge of the Expansion Unit about
three inches from the front edge of SMALL TALK. About one inch from the front
edge, also along the left side between the front edge and the volume control
is a 1/8" phone jack that may be used for connecting an external speaker or
headphones. (See Figure 1-1-2)

SMALL TALK (TOP VIEW)

Figure 1-1-1

Speaker Grill

Expansion Unit

T-1000 Small Talk Portable Note-Taking Device

SMALL TALK (LEFT EDGE)

Figure 1-1-2

Volume Control   Earphone Jack
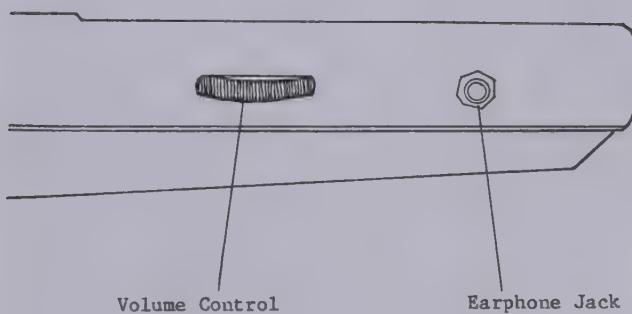
SMALL TALK's keyboard is a full, alphanumeric typewriter keyboard with additional special purpose, or "function" keys which we'll discuss in detail later. When you place your hands on the keyboard, you will notice two raised dots on the home row: one on the letter "D" and another on the letter "K"; these dots will help you orient yourself to the keyboard.

With the keyboard in front of you in its normal operating position, let's examine the rest of SMALL TALK's features. Directly above the left side of the keyboard, two inches from the top edge, and about two inches to the right of the speaker grill, is the built-in micro-printer. You should be able to locate the slot opening from which the paper feeds. A clear plastic bar about 1/4" wide by 2 1/2" long with a serrated cutting edge along the top is fixed within a small piece of plastic that fits on top of the printer and protects the ribbon. This piece of plastic is removeable and must be removed when you replace the printer ribbon cartridge and to help feed paper through the printer when you replace the paper. A roll of paper and a ribbon cartridge have already been installed for you. The micro-printer is a dot-matrix type printer that can print a 24-column wide line. Additional information on the printer is contained in Parts 1 and 2 of this manual. (See Figure 1-1-3)

Directly below the micro-printer are two controls. The one on the left, about 1 1/2" below the left edge of the printer's cutting bar is the power switch for the RS-232C port. This is a sliding switch, and sliding it to the left turns off the RS-232C port; sliding it to the right activates the port. One inch to the right of this sliding switch is a similarly shaped switch; this is the paper feed used when advancing and loading paper. Pushing down on the switch engages the paper feed and rolls the paper through. Specific information on loading the printer is contained in the Appendix. (See Figure 1-1-3)

Next to the printer, on the right, is the smooth, glass surface of the Liquid Crystal Display (LCD). The screen displays upper and lower case letters, numbers, and punctuation marks. The format is 80 characters, split into 4 lines of 20 characters each.

Also along the top portion of SMALL TALK is the built-in micro-cassette unit at the upper right, directly right of the LCD screen. (See Figure 1-1-4) The micro-cassette can permanently save information that has been entered with the word processor. Micro-cassettes are readily available at most drug and discount stores. On the right side of SMALL TALK, next to the micro-cassette, is a grooved sliding switch that opens the micro-cassette door. Sliding this switch up away from you snaps open the door. (See Figure 1-1-5) The micro-cassette's 2 1/4" by 1 1/4" door opens from the bottom; it is a hinged door that when open affords about one inch of clearance for the loading and unloading of micro-cassettes. Open the door and you'll find the MC-30 tape provided with SMALL TALK. Before you close the door, make certain the tape is inserted all the way back. Press the door closed. (See Figure 1-1-6)

Printer

Figure 1-1-3

Paper Lead

Serrated
Cutting Edge

Clear
Plastic Bar

PUSH

PRINTER
OFF   ON

PAPER
FEED

RS-232C Peripheral
Expansion Port
Switch

Printer Paper
Sliding Switch

Left Side of
Liquid Crystal
Display Screen

Right Side of
Liquid Crystal
Display Screen

Microcassette
Unit

MICRO CASSETTE DRIVE

O REC

		NUM	HOME CLR	SCRN	INS DEL

| | | { (| }) | : / |
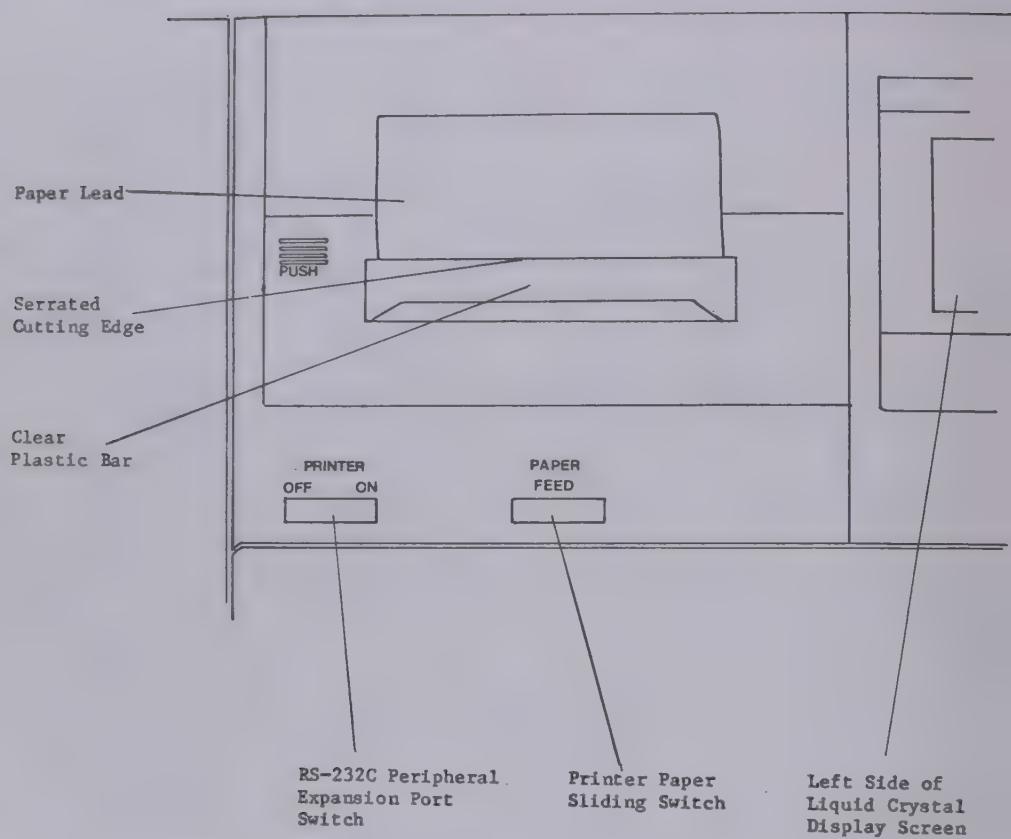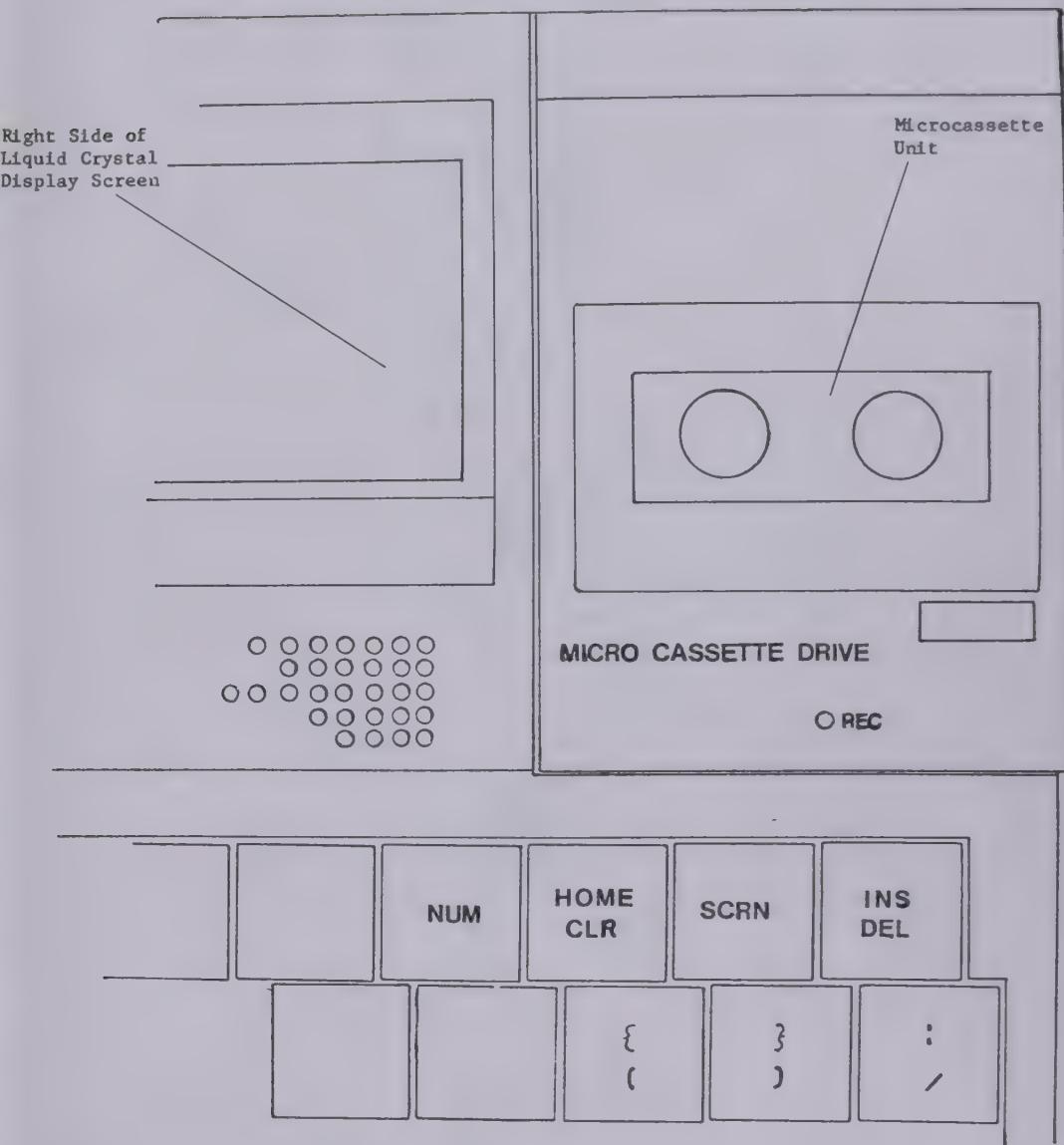
SMALL TALK'S RIGHT EDGE

Figure 1-1-5

Switch to Open
Microcassette Door

Reset Switch
(Recessed)

Future Accessory
Jacks

LCD Screen
Viewing Angle
Adjustment

Power Switch

Figure 1-1-6

Microcassette
Cover

MC-30 Tape

MI

○REC

NUM	HOME CLR	SCRN	INS DEL
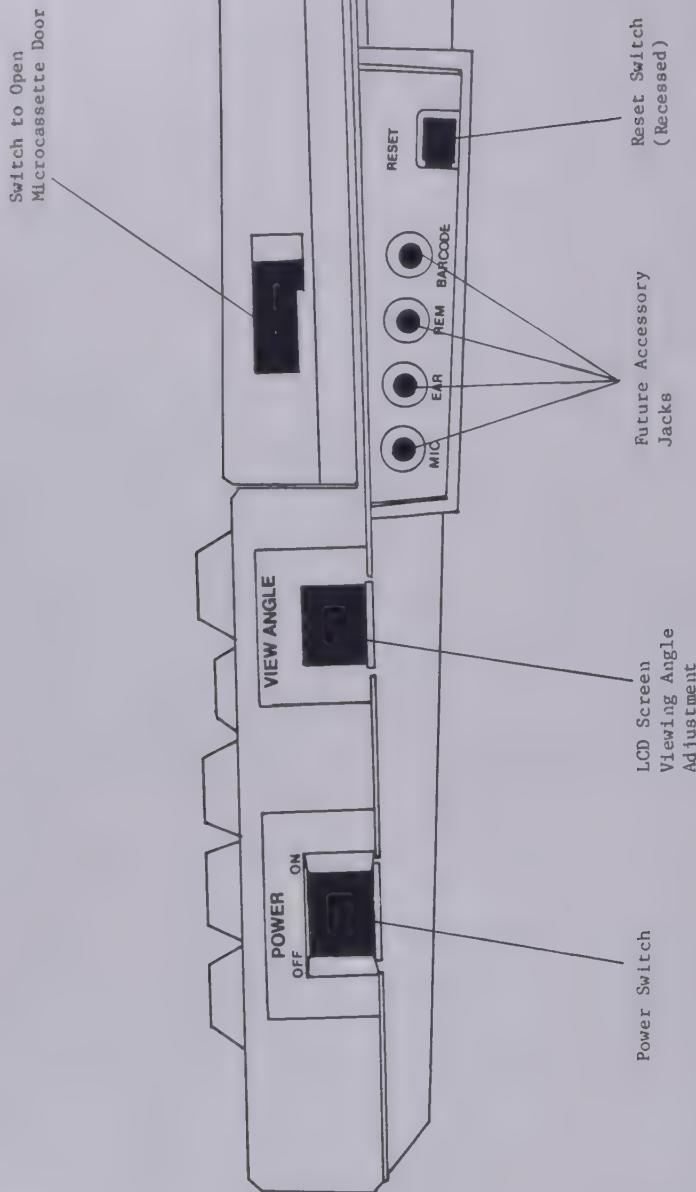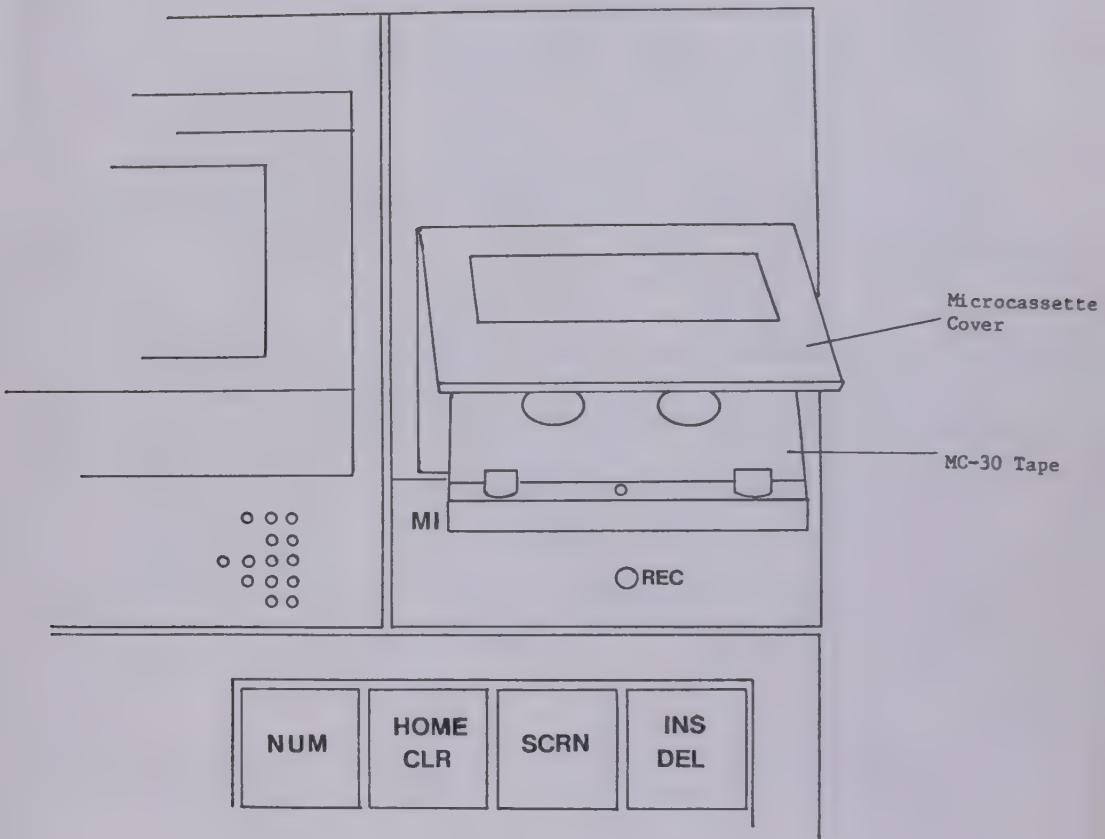
Below the micro-cassette door switch on the right edge is a row of 4 mini-jacks. These are not used now, but they are labelled "mic", "ear", "rem", and "barcode". To the right of these horizontally arrayed mini-jacks, and about one inch from the back edge is a small square opening with a recessed button inside. This is the RESET button. It is recessed to protect it from accidentally being reset. Resetting SMALL TALK will erase all the information that's been entered in memory. The RESET is used to restore SMALL TALK's factory setting. (See Figure 1-1-5)

Closer to the front of SMALL TALK, on the right edge, are two additional important controls. About 1 1/2" from the front edge, up along the right side, is a sliding POWER switch. Sliding this switch UP turns SMALL TALK on. Sliding it down, towards you, turns SMALL TALK off. 3 1/2 inches up from the front and still on the right edge ia a second control--a control similar to the Volume Control, but this one adjusts the viewing angle of the LCD screen. (See Figure 1-1-5)

The back edge of SMALL TALK contains two circular cut-outs. These are the serial communication ports, and they are located on the back edge of SMALL TALK as the keyboard faces you. Located 4 1/2 inches in from the upper right edge, the first one (4 1/2 inches from the right edge) is the standard, RS-232C serial port. This is the port necessary to connect external peripherals such as full-size printers, other computers, and modems. The RS-232C port will be discussed in detail in Part 3: THE WORD PROCESSOR. (See Figure 1-1-6)

The second round cut-out, next to the RS-232C port, and exactly five inches in from the right edge, is labeled SERIAL and is a high-speed port presently reserved for future SMALL TALK accessories.

Finally, just to the right of the RS-232C port, again as SMALL TALK faces you, and 3 inches from the right edge, is a small female connector used for SMART CHARGER. It is labeled ADAPTOR.

Section 2: PREPARING TO USE SMALL TALK

Section 2-1: Batteries and Charging

SMALL TALK operates two ways: it will run via its built-in NI-Cad battery pack or off an AC wall outlet by means of the SMART CHARGER. When used properly, the pack is designed to run for years without maintenance. If you ever suspect that the battery pack is working improperly, contact VTEK. Only VTEK or an authorized VTEK dealer can service the battery pack.

SMALL TALK tells you when it needs recharging by displaying and speaking three times the following message: "charge battery." It will then shut itself off. However, you won't lose any information you've entered. SMALL TALK always shuts down while there is still ample current remaining to hold the memory contents. When SMALL TALK tells you to recharge it, turn off the POWER SWITCH. Connect the SMART CHARGER before continuing to work with SMALL TALK.

In order to connect the SMART CHARGER, find the small barrel connector on the end of the SMART CHARGER power cord. Insert this connector into the jack labeled ADAPTER at the back of SMALL TALK. (See Figure 1-2-1) Then plug the SMART CHARGER into any suitable wall outlet. A red indicator lamp will light on the SMART CHARGER to inform you that SMALL TALK is recharging. The light will go out when SMALL TALK is completely charged. RECHARGING TAKES APPROX-IMATELY EIGHT HOURS. You can use SMALL TALK when it is connected to the SMART CHARGER, but it will then take longer than eight hours to fully charge it.

It is perfectly acceptable to use the SMART CHARGER as a guarantee that your machine won't fail during important work. It won't damage anything to run SMALL TALK via AC current while printing long documents, using the microcas-sette extensively, or engaging in any tasks that may make power demands on the NI-Cad batteries. These two accessories in particular demand a lot of power to run. On a full charge, SMALL TALK can last up to two weeks depending on how often you use the accessories.

Any time that SMALL TALK is plugged in, the SMART CHARGER will charge the battery pack. Therefore, if you wanted, you could leave SMALL TALK plugged in at all times because once SMALL TALK is fully charged, the SMART CHARGER stops charging. The battery pack has probably run down since SMALL TALK was shipped from the factory, so the first time you use it, you should use the AC current.

Switch for Removing   "Smart Charger"   RS-232C Port   Serial Port
Microcassette Cartridge   Connector
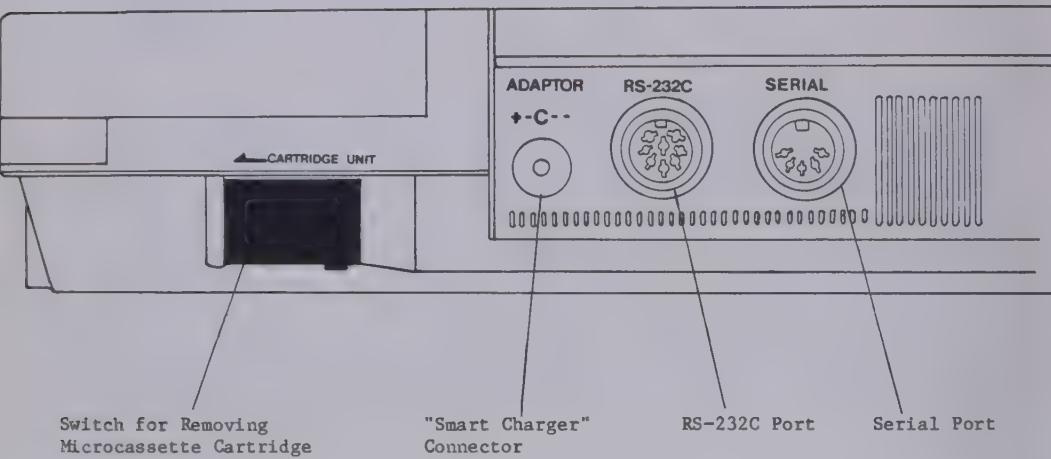
Section 2-2: Turning SMALL TALK On--The System Menu

Plug SMALL TALK in and turn it on. Push the POWER SWITCH away from you and
watch for the following things: first, a soft beep will sound; then you'll
hear the voice say, "SMALL TALK TM X.X" as the System Menu is displayed on
the screen.

Here is the System Menu:

SMALL-TALK (TM) X.X
W = WORD PROCESSOR
C = CALCULATOR

Notice that only the title of the menu is read. This is because once you
know what the screen has on it, you'll always remember it and won't want
to be bothered by having it read to you repeatedly. Now press the space
bar on the keyboard. SMALL TALK will again beep and present you with the
System Menu. This time, you'll hear the whole screen read.

We should pause a moment and discuss the concept of menus. It may seem
strange to refer to the contents of a computer screen as a menu, but menus
to computer operators mean selections. Computer operators often work through
through menus where they are presented lists from which they make a choice
or selection. SMALL TALK requires no knowledge of computers or data pro-
cessing in order to be used effectively, but as certain terms become neces-
sary to know, we will inform you of them.

SMALL TALK's System Menu offers you either of the two built-in programs:
Word Processing and Calculator. The menu is telling you that you can use
either of these programs by typing in a single letter to identify your
selection. The menu is asking you to enter a "W" or a "C". If you press
any other key, as you did the space bar a moment ago, SMALL TALK will beep
and read the entire menu to you to refresh your memory about the options
available to you.

The two built-in programs listed on the System Menu are the subjects of
Part 2: THE CALCULATOR and Part 3: The WORD PROCESSOR. At this point, it
is important only that you understand that when you begin work with SMALL
TALK, you always begin with the System Menu. With it you can go back and
forth between the two programs. The System Menu is so important that a
special key is used for calling it up at any point during your work with
SMALL TALK.

Section 2-3: Function Keys

Above the standard typewriter area of SMALL TALK's keyboard is a group of
Function keys. Located about 1/2 inch above the "1", "2", and "3" number
keys of the typewriter keyboard is a group of three horizontally thin keys.
These keys are each 1/2" long and 1/8" apart. Beginning from left to right,
these keys are labeled TIME/DATE, MENU, and BREAK. The BREAK key is a red
key. Almost 1/2" to the right of the BREAK key is a group of five keys, also
horizontally thin. These keys are the VOICE function keys and will be dis-
cussed in Section 3: The Voice. The first group of keys, the SYSTEM FUNCTION
KEYS is our concern now. (See Figure 1-2-2)

Function keys provide additional controls for SMALL TALK. Pressing the first
key, the TIME/DATE key, announces the time and date. If you press this key,
SMALL TALK will respond by giving you the time and date. The next section will
discuss how to set the time and date.

The second System key, labeled MENU, is the important key that immediately
calls up the system menu, no matter what else SMALL TALK is doing at the
time. If you are in the Calculator Program and want to enter Word Process-
ing, press the MENU key and you can exit the Calculator Program and enter
the Word Processing program. And, of course, you may press the MENU key
to call up the Menu System to exit the Word Processing program and enter the
Calculator Program.

The third and final key in this group is the BREAK key. This key is used
to abort, or stop tape and printing operations. Additional information on
using the BREAK key is provided in PART 3: THE WORD PROCESSOR.

Section 2-4: Initializing

Initializing is the process by which you set the time and date. Each time
you use SMALL TALK it is a good idea to initialize; setting the date pro-
vides you with a reference for the work you are doing at a specific time
and it restores SMALL TALK to its factory-fresh condition.

Initializing begins by becoming familiar with two Function keys. One of
these keys is one of the most important keys on SMALL TALK or any compu-
ter--the CONTROL key, located next to the left side of the "A" key on the
keyboard's Home Row. The CONTROL key says "CTRL" and is only operational
when used with another Function key. For example, pushing it by itself
does nothing. However, pressing it and holding it down while you press
another key activates both keys. (See Figure 1-2-3)

The other key used with the CONTROL key to initialize is the @ key located
on SMALL TALK next to the right side of the "P" key. Remember that the

FUNCTION KEYS

Figure 1-2-2
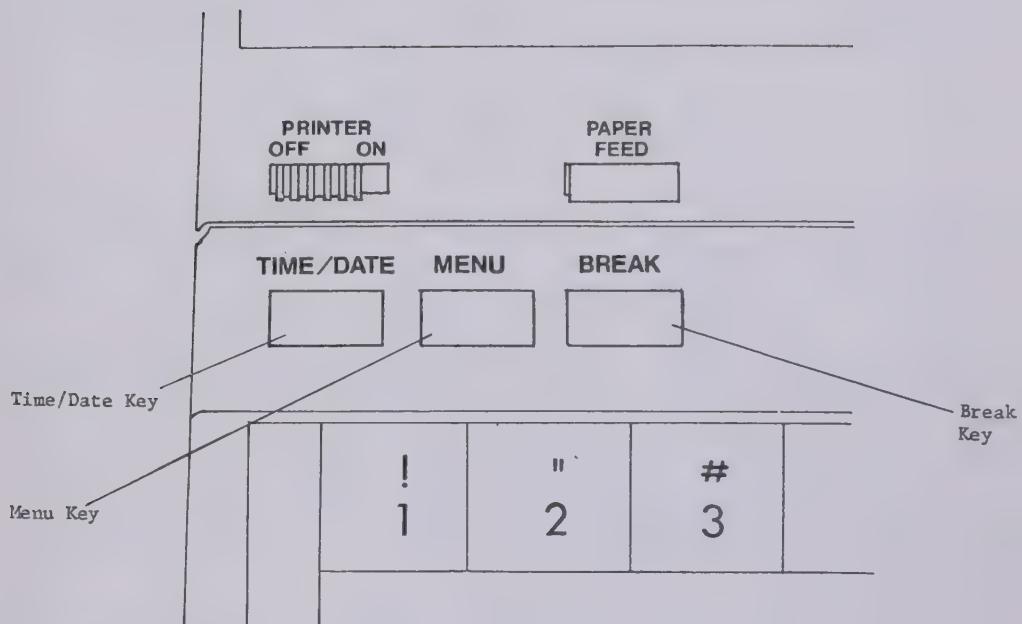
Control Key
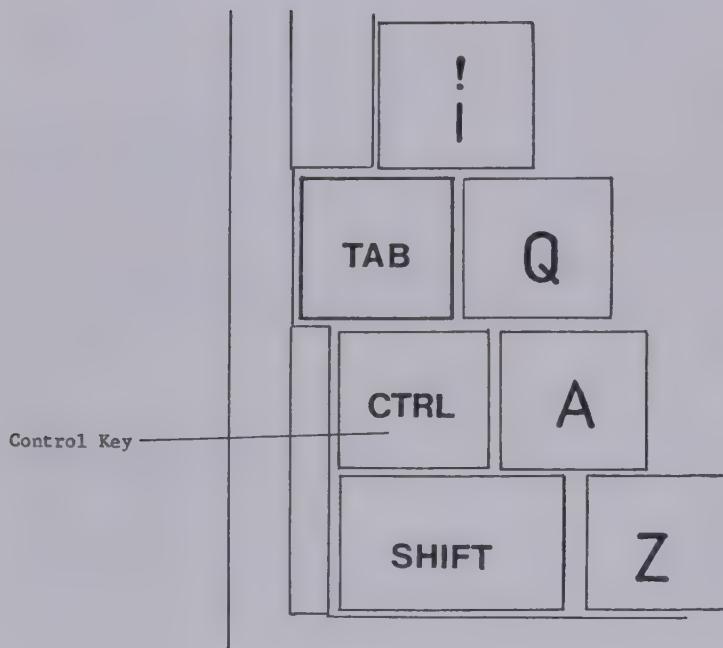
@ key on SMALL TALK may not be in the same place as on typewriters you may be used to. (See Figure 1-2-4) To indicate the use of two keys in combination, with the CONTROL key and the @ key, we'll designate them as CTRL-@. If you now type this combination, pressing and holding the CONTROL key while pressing and then releasing both keys, SMALL TALK will display on the LCD screen and speak the following message:

                        ENTER DATE AND TIME
                        MMDDYYHHMMSS
                        =
                        PRESS BREAK TO ABORT

The "MMDDYYHHMMSS" tells you what information to enter. The first two letters, "MM" tell you to enter two digits represnting the month. The second two letters "DD" tell you to enter two digits representing the date. The third two letters, "YY" tell you to enter two digits representing the year. "HH" stands for hours; "MM" stands for minutes, and "SS" represents seconds.

For example, if today is October 14, 1985 and it is 8:45 AM, you would enter the following information: 101485084500. To enter this data, press the red RETURN key at the far right of the Home Row. The RETURN key is located on SMALL TALK in the same place it is on any standard typewriter.

Having pressed the indicated keys, you have entered "10" to represent October; you have entered "14" to indicate the 14th. of the month; you have entered "85" to represent the year; you have entered "08" to indicate 8:00 AM; you have entered "45" to show that it is 45 minutes after the hour; and you have indicated "00" as seconds.

Note that the time has been entered in military, or 24-hour time. Therefore, if it were 8:45 PM, you would have entered "20" instead of "08". Thus, the same entry showing 8:45 PM would look like this:

                        101485204500

This sequence reads "10" for October; "14" for the fourteenth of the month; "85" for the year; "20" for 8:00 PM; "45" for 45 minutes after the hour; and "00" for seconds.

After you press the RETURN key which enters the date and time, SMALL TALK will display and speak the following notice:

INITIALIZING KEYS

Figure 1-2-4

SMALL TALK KEYBOARD

To Initialize: CTRL and @ Keys
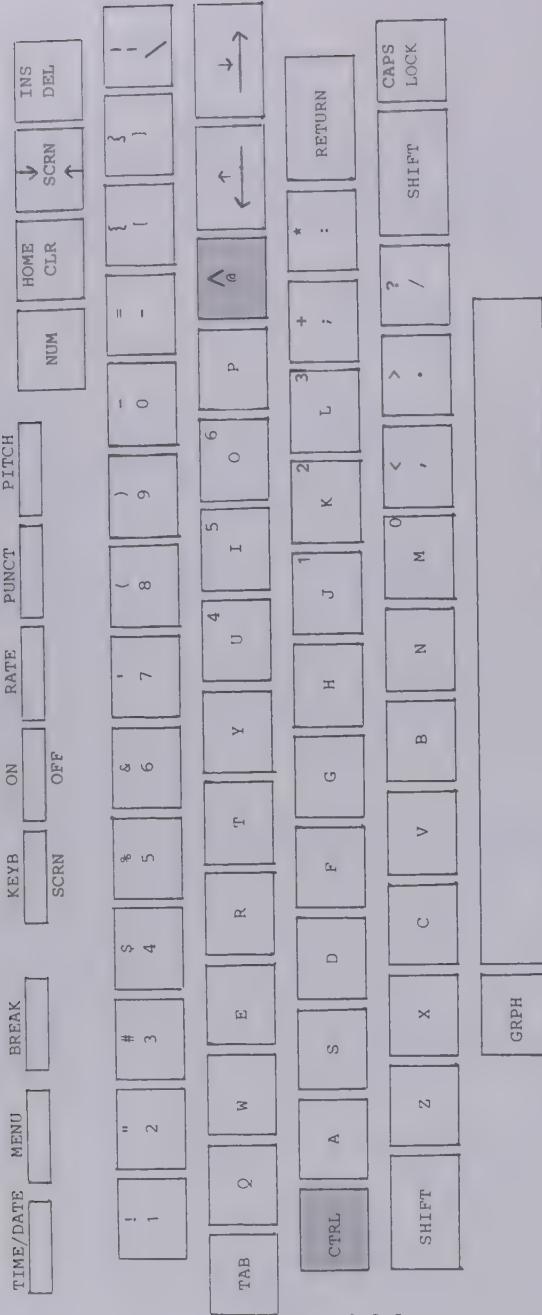
```
                    WELCOME TO
                  SMALL TALK  (TM)
                   VERSION X.X
                  COPYRIGHT (C) 1985
                        BY
                COMPUTER AIDS CORP.
                FORT WAYNE, INDIANA
                ALL RIGHTS RESERVED
                   WRITTEN BY
                 DOUGLAS GEOFFRAY
                       AND
                   JEREMY FORD
```

Immediately after the copyright information is read, SMALL TALK presents the
System Menu, indicating that SMALL TALK is ready to work.

Section 3: THE VOICE

Section 3-1: SMALL TALK'S Two Voices

SMALL TALK has two distinct voices which may be controlled separately. One of these voices is associated with information displayed on the screen and the other is associated with keys typed at the keyboard. SMALL TALK's voice can by tailored to meet your own needs.

Section 3-2: Voice Function Keys

In the last section, we briefly mentioned a group of five Function keys directly above the standard keyboard. These five keys constitute the Voice Function Group, and they are used to select various voice characteristics. (See Figure 1-3-1)

The first key in the group is the KEYBOARD/SCREEN key, and is labeled "KEYB/SCRN." Remember, this and the other Function keys above the keyboard itself itself are horizontally narrower than the other, standard keys, and their labeling is not on the keys themselves, but written above and occasionally above and below each key. For example, the KEYBOARD/SCREEN key says "KEYB" above the key and "SCRN" below.

This key determines which voice--screen or keyboard--you work with. The other four keys to the right of the KEYBOARD/SCREEN key actually determine the specific voice features you will select, and each voice has its own array of available settings. Therefore, each time you press the first Voice Function Key--KEYBOARD/SCREEN, SMALL TALK goes back and forth between the Keyboard and the Screen voices. The messages SMALL TALK gives you will correspond, of course, with whichever mode, Keyboard or Screen, is active at the time.

Moving left to right across this group of Voice Function keys, with SMALL TALK set in Screen mode, the first key encountered is the ON/OFF key. As with the first key and all other Voice Function keys, a message announces the active setting as the settings change. Certain settings for each of SMALL TALK's functions have been preset at the time of manufacture. This factory setting is called a "Default". Each of the Voice Function keys has a default setting that you can change as you need.

The next key, directly right of the ON/OFF key, is the RATE key. Pressing this key determines the speed of the voice. Try pressing this key several times; the speed of the messages changes according to the different settings. The "Default" setting is "Rate 3." During your initial work with SMALL TALK you may want to slow the screen voice down to "2" or "1". After you become accustomed to the voice, you will probably feel more comfortable with Rates "3" or "4".

VOICE FUNCTION KEYS

Figure 1-3-1

SMALL TALK KEYBOARD

TIME/DATE MENU BREAK

KEYB ON RATE PUNCT PITCH
SCRN OFF

NUM HOME CLR INS DEL
HOME/SCRN

TAB 1 2 3 4 5 6 7 8 9 0 - = [ ] \

CTRL Q W E R T Y U I O P @ * ← →

SHIFT A S D F G H J K L ; : RETURN

SHIFT Z X C V B N M , . / SHIFT CAPS LOCK

GRPH
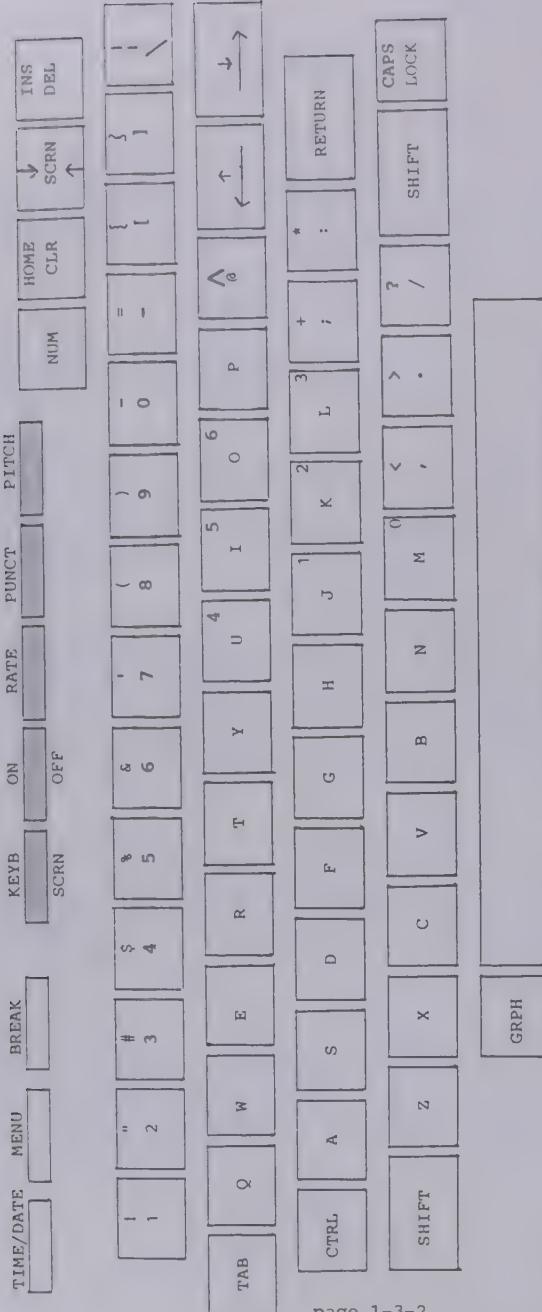
The next key, moving left to right, directly right of the RATE key, is the PUNCTUATION key. Labeled "Punct," this key chooses the number of punctuation marks and special symbols that are read by the voice. If you want to hear all the punctuation marks that you enter, your would select Punctuation Level 4—"All." There are four levels of punctuation from which to choose: "None," "Some," "Most," or "All." These names designate the number of punctuation marks that you will hear. "None" means that nothing but the letters of the alphabet are heard. "Some" voices various punctuation marks and mathematical symbols. "Most" announces everything included in these two settings and additional punctuation marks. "All," of course, voices every mark of punctuation in addition to blank spaces.

> NOTE: The "Default" setting for the Screen Voice is "Some."
> The "Default" setting for the Keyboard Voice is "Most."

After you have become accustomed to the several levels of the PUNCTUATION key, you may select that level with which you are most comfortable.

The final key among the Voice Function keys, located just to the right of the PUNCTUATION key, is the PITCH key. There are five levels of pitch from which to choose. The "Default" for both Screen Voice pitch and Keyboard Voice pitch is Pitch 3. Experiment with these levels as you would the other Voice Function keys. Experiment also with these keys in combination to determine which levels are most suitable. Many SMALL TALK users prefer a Keyboard Voice a little faster than the screen voice. This often permits faster typing. Others like to deactivate the Keyboard Voice entirely but leave the Screen Voice engaged. Deactivating the Keyboard Voice entirely permits very fast typing. When you set the controls, SMALL TALK stores them in memory even if you turn SMALL TALK off. Resetting SMALL TALK will restore these Voice Functions to their Default settings.

Section 3-3: Momentary Silence

You may occasionally want to silence SMALL TALK's voice when it is reading to you. Another special function accomplishes this: Pressing and holding CTRL and typing "X" once, or, as we designated these control features earlier, "CTRL-X" temporarily silences the voice. You may experiment with this feature to see how it works by pressing the space bar in order to get SMALL TALK to read the System Menu. While SMALL TALK is reading, type "CTRL-X." You will have silenced the voice until you type something else. This is a particularly convenient benefit as you work with further applications and especially when SMALL TALK is speaking a long piece back to you. When the voice has been silenced, you can restore the voice by typing "CTRL-X" again. (See Figure 1-3-2)

MOMENTARY SILENCE

Figure 1-3-2

SMALL TALK KEYBOARD

TIME/DATE   MENU   BREAK   KEYB   ON   RATE   PUNCT   PITCH
                          SCRN   OFF

NUM   HOME   SCRN   INS
      CLR   DEL

TAB
Q   W   E   R   T   Y   U   I   O   P
A   S   D   F   G   H   J   K   L
CTRL
SHIFT   Z   X   C   V   B   N   M
GRPH

RETURN

SHIFT   CAPS LOCK

To Silence SMALL TALK's Voice: CTRL and X Keys

page 1-3-4
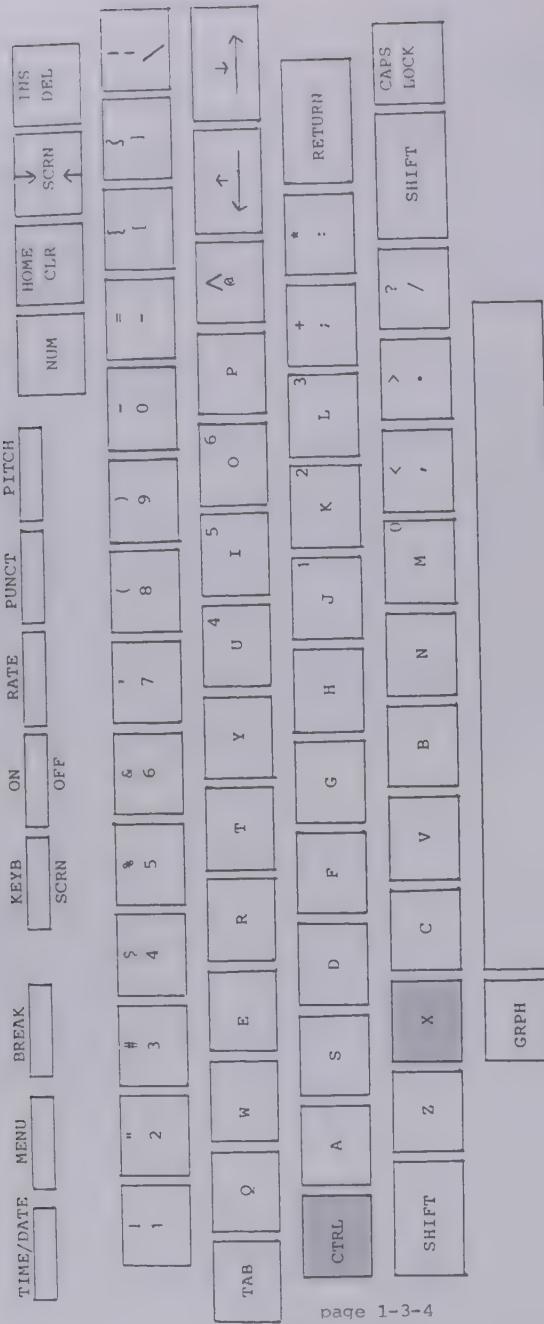
PART 2: THE CALCULATOR

Section 1: Introduction to SMALL TALK's CALCULATOR

Section 1-1: Introduction and Overview

SMALL TALK's built-in Calculator performs calculations from simple arithmetic to advanced trigonemetric and logarithmic functions. Using SMALL TALK as a "Talking Calculator" is easy. The program in SMALL TALK that enables it to perform its scientific calculations is called "Calc-Talk" and Calc-Talk features the four basic mathematical functions: addition, subtraction, multiplication, and division. Calc-Talk also has ten memories, allowing you to use exponents, calculate roots, perform trigonometric functions, and use natural and common log functions. A special INVERSE key enables you to perform inverse calculations such as finding square roots as a reciprocal function of finding squares or finding the "Arcsine" ratio as the reciprocating, inverse function of "Sine."

Calc-Talk may be entered and exited at any time. If you are preparing a document while in the Word Processing program, and you want to enter some calculations that require the use of Calc-Talk, you may leave the report you are preparing, enter Calc-Talk, do your calculations, even print them, and immediately return to word processing, returning to exactly where you exited the program.

When you use SMALL TALK as a calculator, the keyboard becomes an advanced calculator keyboard. The standard typewriter keyboard's keys temporarily take on different functions. The right half of the keyboard is used like a typical calculator keyboard. The left side is used for memory and scientific functions.

Section 1-2: Turning the Calculator On and Off

In order to enter Calc-Talk, you need only select "C" from the System Menu. When you press "C", you turn on Calc-Talk and you hear the following message:

CALC-TALK (TM) X.X

This message is Calc-Talk identifying itself, and the "X.X" is a number which identifies a specific version of Calc-Talk. This number is important to remember in case you ever require technical assistance or support for Calc-Talk from your dealer. You are now in Calc-Talk and you are working with a keyboard with a different meaning. (See Figure 2-1-1)

THE CALC-TALK KEYBOARD

Figure 2-1-1

TIME/DATE | MENU | BREAK | KEYB [SCRN / ON OFF] | RATE | PUNCT | PITCH

| DEG/RAD 1 | TAN 2 | COS 3 | SIN 4 | % 5 | & 6 | (NUM) 7 | (NUM) 8 | (NUM) 9 | DIV 0 | = - |

TAB | LOG Q | LN W | Y X / E | X 2 / R | T | Y | NUM 4 / U | NUM 5 / I | NUM 6 / O | MULT / P | @

CTRL | MPLUS A | MSWAP S | MWRIT D | MREAD F | G | H | NUM 1 / J | NUM 2 / K | NUM 3 / L | MINUS / ; | * :

SHIFT | INV Z | % X | CE C | CLEAR V | B | N | NUM 0 / M | , | +/- . | PLUS /

EQUALS / RETURN

CAPS LOCK | SHIFT

HELP / GRPH | THE SPACE BAR CAUSES THE NUMBER BEING DISPLAYED TO BE READ WITHOUT EFFECTING THE STATUS OF THE CALCULATOR
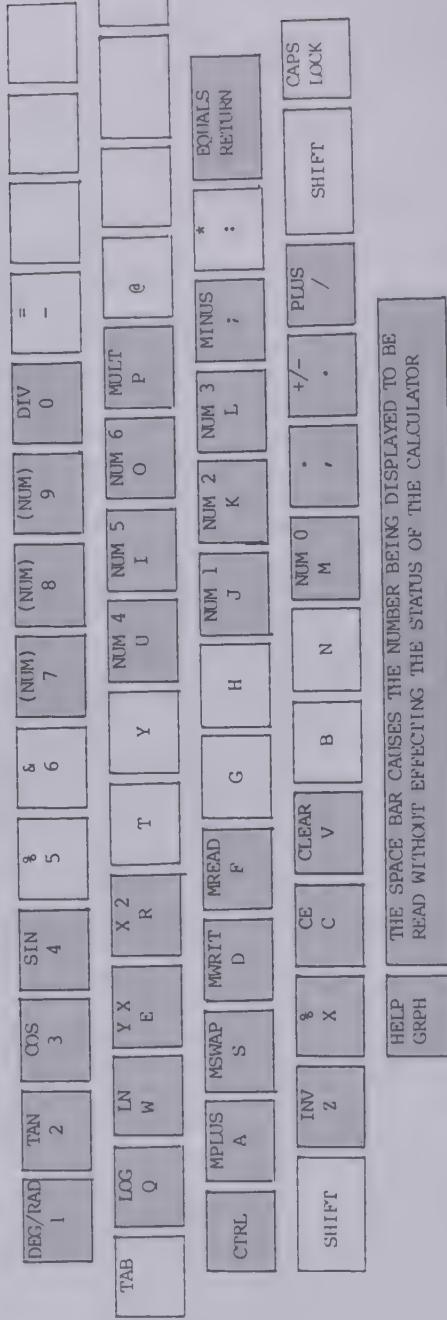
Shaded Keys Are Active Calculator Keys

NOTE: The RETURN key acts as the calculator's EQUALS key.

Section 1-3: The Calc-Talk Keyboard

The Calculator keyboard consists of two sixteen-key arrangements; one group is located on the right hand side; the other is on the left. Each group consists of four rows, each with four columns--thus, the sixteen keys in each group. Calc-Talk also uses two other keys: the RETURN and the SPACE BAR. Each key used by Calc-Talk is outlined and each key's function is described in Appendix A. (See Figure 2-1-1)

When you exit Calc-Talk, you return the keyboard to its normal functions-- those of a standard typewriter keyboard.

Section 1-4: "Help Mode"

The "Help Mode" is designed to allow you to experiment with some of the keys in Calc-Talk. "Help Mode" enables you to be able to press a key and hear its meaning without having to use it. If, for example, you forget the specific function of a key that you only use occasionally, "Help Mode" will help you remember.

To enter "Help Mode," first press the COMMAND key which is labelled "GRPH" and is the key located directly to the left of the SPACE BAR. While holding the COMMAND key down, press any other key. SMALL TALK will announce that particular key's function. Announcing the function in no way disturbs or disrupts the display or any calculator function being performed. You will probably find "Help Mode" most useful for reviewing the arrangement and functions of the keys on the left-hand side of the keyboard.

Be careful, however, that you don't seek the information that "Help Mode" provides without entering "Help Mode" via the COMMAND key. You will get the same information from SMALL TALK by pressing the desired key, but the key will also perform its designated function. This may be harmless; however, if you are in the middle of a calculation, the functioning key may interfere with the operation.

Section 2: CALCULATOR FUNCTIONS

Section 2-1: Calc-Talk's Four Basic Functions

Enter Calc-Talk by calling up the System Menu and selecting "C". You are now in Calc-Talk, and with your right hand in its home-row position, press the letter "J". The "J", in the Calculator Mode is number "1". The number "1" is on the key, written above and to the right of the "J". When you press it, the number will appear on the screen. Now press the number "2", which is the letter "K" key, and press the number "3" which is the "L" key. Having pushed numbers "1", "2", and "3", the number "123" will appear on the screen.

Want to hear what you entered? Press the SPACE BAR and the voice will say, "one hundred twenty-three." You can review what you've entered on the screen at any time by simply pressing the SPACE BAR. Reviewing what you have entered has no effect on the number(s) on the screen.

Calc-Talk's ability to speak each key's name and read the numbers displayed on the screen are dependent on the settings of the Voice Function keys. As we mentioned earlier, you can select what voice features work best for you.

You now have "123" on the screen. We will now subtract "12" from "123." As your fingers rest on the home row, press the key beneath the little finger of your right hand. This is the "+/;" key in the Word Processing Mode, but it is the MINUS key in the Calculator. After pressing the MINUS key, enter "12" by pressing the "1" and "2" as you did when you entered "123." Finally, press the EQUALS key which, in the Calculator Mode, is the RETURN key. The answer to "123" minus "12" is "111," and SMALL TALK will speak "one hundred eleven" as it displays it on the screen. Pressing the SPACE BAR will cause SMALL TALK to speak the answer again.

That was one basic calculation. A second calculation will demonstrate additional features of Calc-Talk. For example, we'll add "54" and "68". You should still be in the Calculator Mode, but if for some reason you are not, call up the System Menu and then press "C". Press "54", press the PLUS key, which is located below and slightly to the right of the MINUS key (the PLUS key is the "?" key when not in the Calculator Mode) and enter "68". Now press the EQUALS key. That completes the operation and the answer, "122", appears on the screen as SMALL TALK speaks the answer.

In order to perform any of the four basic arithmetic operations, use this above-described pattern: number--operation sign--number--EQUALS key. You may continue to perform a sequence of operations without pressing the EQUALS key. You can enter additional mathematical operations indefinitely; each time a new number is entered, the pending operation is completed as if the EQUALS key had been pressed. The result from the previous operation becomes the first number entered in the subsequent operation.

For example, what if you wanted to add a string of numbers? We'll add "35", "48", "177.35" and ".56". (We will call each of these numbers "operands".)

Enter the first operand "35". SMALL TALK displays "35" on the LCD screen
and speaks it. Press the PLUS key ("?" key on the typewriter keyboard).
SMALL TALK speaks the word "plus." Press "4" and "8" in order to enter the
operand "48". SMALL TALK speaks each number individually, speaking "four" and
"eight" and "48" is entered and displayed on the screen. Press PLUS. SMALL TALK
speaks the total of "35" and "48" and speaks the word "plus." Thus, SMALL
TALK says "eighty three plus." Similarly, enter "177.35" by pressing "1", "7",
"7", decimal point ("</," key on the typewriter keyboard), "3", "5", and PLUS.
SMALL TALK displays and speaks "one seven seven point three five plus" and dis-
plays the running total of 260.35. Finally, enter the last operand, "decimal
point", "5", and "6", and EQUALS. SMALL TALK will speak "decimal point, five,
six, equals, two hundred sixty point nine one."

To calculate the sum of "35", "48", "177.35", and ".56" do the following:

Press 3 5 PLUS key 4 8 PLUS key PLUS 1 7 7 Decimal Point 3 5

PLUS key Decimal Point 5 6 EQUALS

Section 2-2: Clearing and Correcting Entries

If you enter an operand incorrectly, you can easily clear it out and enter the
correct number in its place. This is the function of the CLEAR ENTRY key. The
CLEAR ENTRY key in the Calculator is the "C" key on the typewriter keyboard.
The CLEAR ENTRY key clears out only the last entry, so if you want to add
"35" and "48" but you have entered "35" and "58"; press the CLEAR ENTRY key
and enter "48". The "48" replaces the cleared "58".

To clear an entry, for example, "58" and replace it with "48":

Press CLEAR ENTRY 4 8

Remember that the CLEAR ENTRY key is for clearing entries and nothing else.
It does not clear a number shown on the screen resulting from a calculation.
There is, however, another operation that clears a number shown that is a re-
sult of an operation.

Next to the CLEAR ENTRY key is the CLEAR key (the "V" key on the typewriter
keyboard). The difference between these keys is that the CLEAR key clears
everything--it clears all numbers, operation signs, and results from all pre-
vious calculations.

Therefore, use the CLEAR ENTRY key only to clear operands, or individual num-
bers that are parts of calculations. Then enter the correct operand. When two
or more calculation signs are entered in succession, only the last one entered
is used. The first one(s) are erased.

Section 2-3: The TIMES/MINUS Key

The last thing we mentioned was that whenever two or more calculation signs, or operators are entered in succession, the first one(s) are ignored and only the last one is used. This can be a problem if you work with negative numbers. If you wanted the result from the problem "5 minus (-3)" and entered "5", MINUS, "-3", SMALL TALK would give you a result of "2". SMALL TALK would have ignored the first minus, and read the minus prefixed to the "3" as an operation sign. The correct answer is "8". The second time the MINUS key was pressed, the first minus sign was discarded.

However, the TIMES/MINUS key eliminates the problem. To calculate 5-(-3) the correct way, enter "5" and press the MINUS key. Now enter "3". At this point in our calculation, we have "5" - "3". The screen shows a "3". If you use the SPACE BAR to review the screen contents, you will hear "3". In order to change that "3" to a negative "3", press the TIMES/MINUS key (the period key on the typewriter) ONE TIME. The number on the screen will change from "3" to "-3". Press the SPACE BAR to review the contents of the screen and you will hear SMALL TALK speak "minus three." Having changed this operand into a negative number has not changed the other components of the calculation; but "-3" is the second operand, not "3". Pressing the EQUALS key gives us the correct answer—"8".

Thus, to calculate 5-(-3), do the following:

Press̲   5̲   MINUS̲   3̲   TIMES/MINUS̲   EQUALS̲

Essentially, the TIMES/MINUS key multiplies the displayed number by negative "1", thus changing its sign. Continually pressing the TIMES/MINUS key continually changes the number from positive to negative to positive to negative.

Section 2-4: The Printing Calculator

If you want your calculations printed, simply type CTRL-P. This turns on the printer and you will hear the message "Printer On." When the printer is on, each operand, operation sign, and result is printed as the work is performed.

Turn the printer on by typing CTRL-P and listen for the spoken message confirming that the printer is on. We'll do a series of calculations and note that the operations are spoken, displayed on the LCD screen, and printed on the microprinter. We'll calculate the following problem:

$$105.95 + 619.20 - 320 - 59.23 - 17.69$$

Enter this problem this way:

Press   1̲ 0̲ 5̲ decimal point̲ 9̲ 5̲ PLUS̲ 6̲ 1̲ 9̲ decimal̲ point̲ 2̲ MINUS̲ 3̲ 2̲ 0̲

MINUS̲ 5̲ 9̲ decimal̲ point̲ 2̲ 3̲ MINUS̲ 1̲ 7̲ decimal̲ point̲ 6̲ 9̲ EQUALS̲

The printout will look like this:

```
105.95                        +
619.2                         -
320                           -
  59.23                       -
  17.69                       =
328.23                        <
```

SMALL TALK's CTRL-P command is a toggle switch. That means that if the printer is on, and CTRL-P is typed, the printer will be turned off. Therefore, you use CTRL-P to turn the printer both on and off. When you turn the printer off, SMALL TALK confirms by speaking "printer off."

Section 3: Calculator Memories

Section 3-1: MEM READ and MEM WRITE

SMALL TALK's ten memories make calculator work easier. You can hold inter-
mediate results during subsequent calculations and call up the contents of the
memory for later calculation. The memories of SMALL TALK allow you to store
results and constants semi-permanently, use stored values in calculations, re-
view the contents of the memory, and accumulate results in memory directly.

The memory keys are easy to find. They are the four keys on the left side
of the home row. The MEM READ key in the Calculator Mode is the "F" key on
the typewriter keyboard. Press and hold the COMMAND key (just to the left
of the SPACE BAR, labelled "GRPH"), and press the MEM READ key. The voice
will speak "Mem Read." There are ten memories in Calc-Talk, and you have to
choose which of the ten to read. You identify the memories by entering a
number 0-9. To read Memory #1, for example, simply enter a "1". The memory's
contents will be displayed on the LCD screen and spoken. If you want to read
the contents of Memory #2, press the MEM READ key, then press "2". The contents
of Memory #2 are shown on the screen as well as spoken. (See Figure 2-3-1)

When you read a memory, you don't alter its contents. The MEM READ key acti-
vates a function that just copies the memory's contents, puts it on the screen,
but doesn't erase or alter it.

The MEM WRITE key is directly left of the MEM READ key; it's the "D" key on the
typewriter keyboard. MEM WRITE means you are entering, or writing something into
the memory. First you must write, or enter a number to the screen. You can en-
ter any number you want, or you can enter a number that is the result of a cal-
culation, or you can read a number from a different memory and store it in the
memory. Whatever number you choose to enter into memory and save must be
on the screen. Then simply press MEM WRITE, and follow that by pressing the
number of the memory that's to be used. For example, to save the mathematical
constant, pi, or 3.141, in memory 0, enter the number, press the MEM WRITE
key, and enter the number 0. In order to confirm this operation, clear the
calculator with the CLEAR key, press MEM READ, and press 0. The number 3.141
will show up on the screen and be spoken.

Enter 3.141 into memory 0 in this way:

Press ⒊ decimal point ⒈ ⒋ ⒈ MEM WRITE ⓪

To confirm that 3.141 has been entered into Memory #0 do the following:

Press CLEAR MEM READ ⓪

CALC-TALK'S MEMORY KEYS

Figure 2-3-1

| TIME/DATE | MENU | BREAK | KEYB | ON | RATE | PUNCT | PITCH |
| | | | SCRN / OFF | OFF | | | |

TAB											= -
CTRL	LOG Q	TAN W	COS E	SIN R	X 2 T	Y	(NUM) 7 U	(NUM) 8 I	(NUM) 9 O	DIV 0 P	MULT @
	MPLUS A	MSWAP S	MWRIT D	MREAD F	G	H	NUM 4 J	NUM 5 K	NUM 6 L	NUM 3 ;	MINUS :
SHIFT	INV Z	% X	CE C	CLEAR V	B	N	NUM 0 M	,	+/- .	PLUS /	EQUALS RETURN
										SHIFT	CAPS LOCK

| DEG/RAD 1 | TAN 2 | COS 3 | SIN 4 | % 5 | & 6 | (NUM) 7 | (NUM) 8 | (NUM) 9 | DIV 0 | = - |

HELP GRPH   THE SPACE BAR CAUSES THE NUMBER BEING DISPLAYED TO BE READ WITHOUT EFFECTING THE STATUS OF THE CALCULATOR
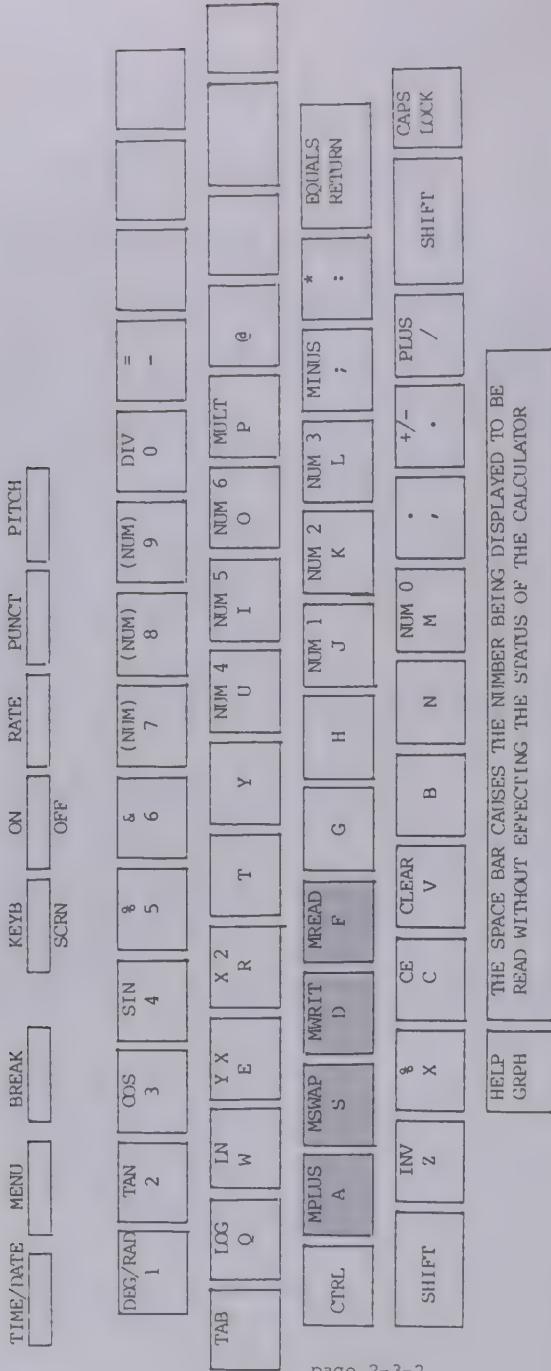
NOTE: The RETURN key acts as the calculator's EQUALS key.

Calc-Talk's Memory Keys Are the A, S, D, F Keys of the Typewriter

Having saved a number in memory, how do we use it? We have just saved the number 3.141 in Memory #0. What if we wanted to retrieve this number, in other words, retrieve the contents of the memory and use it? Let's add the number to 5. All we have to do is enter 5 + MEM READ 0.

To add the contents of Memory #0 to "5", do the following:

Press $\boxed{5}$ $\boxed{+}$ $\boxed{\text{MEM READ}}$ $\boxed{0}$

You are beginning to see that reading a number from memory with the MEM READ key is equal to entering it into the operation yourself. Any number that is entered on the screen will be accepted as an operand.

As with most information entered into SMALL TALK, the calculator memories will not disappear if you exit Calc-Talk. All memories remain intact until they are changed or if SMALL TALK is reset or initialized.

Section 3-2: MEM SWAP

MEM SWAP means swap, or exchange a number, and this function enables you to review the contents of a memory. MEM SWAP, located in the Calculator Mode at the "S" typewriter key, exchanges the number in the specific memory with a number that's displayed on the screen. This way you get to look at and review the number in memory. When you have reviewed the contents of the memory to your satisfaction, press MEM SWAP again to restore the original display if you desire to see the original display again. If you want to review or look at the contents of Memory #8, for example, press MEM SWAP and press "8".

To review the contents of memory #4:

Press $\boxed{\text{MEM SWAP}}$ $\boxed{4}$ and to to restore the original screen Press $\boxed{\text{MEM SWAP}}$ $\boxed{4}$ again

Section 3-3: MEM PLUS

If you want to accumulate a running total in a memory, you can do this with MEM PLUS. MEM PLUS is located on the "A" key of the typewriter keyboard. Storing accumulative results in memory is a very convenient feature as it frees the screen for intermediate calculations. When you anticipate this situation, do your addition in memory so that you may use the screen for other calculations.

You must first clear the specific memory you want to use. If you are not certain that the memory you want to use is clear, put a "0" in it with MEM WRITE. Now, to add a number to memory, get the number on the screen, press MEM PLUS, and then add the number of the specific memory into which you want to enter the number. To enter 25 in Memory #7, for example,

Press $\boxed{0}$ $\boxed{\text{MEM WRITE}}$ $\boxed{7}$; Press $\boxed{25}$ $\boxed{\text{MEM PLUS}}$ $\boxed{7}$

Section 4: Scientific Functions

Section 4-1: Squares and Square Roots

Calc-Talk provides a complete set of scientific functions and their inverses.
These functions are accessed on the two rows above the left hand home row. The
INVERSE key is directly below the MEM PLUS and MEM SWAP keys. Calc-Talk allows
you to square a number or raise it to any power you want, take square roots, de-
termine trigonometric functions, and use the PERCENT key and the 1/X, or recip-
rocal function.

Finding squares is one of the simplest functions you will learn. You press one
key--the SQUARE key. The SQUARE key is struck with the left index finger; it is
the "R" key on the standard typewriter keyboard. If we want to square a number,
enter the number into the calculator and press the SQUARE key. The answer ap-
pears on the screen and is spoken by SMALL TALK.

To square the number 25, for example,

Press 25 SQUARE, and receive the answer--625

Every time you hit the SQUARE key, the number displayed on the screen is squared.

The squaring function is called a "unary" function because only one number, or
operand is required to complete the calculation. Other operations like addition,
subtraction, multiplication, and division require at least two operands; there-
fore, they are called "binary" functions. Many of the scientific functions per-
formed by Calc-Talk are "unary" functions, which means that they will be per-
formed immediately on the displayed number. For example, another "unary" func-
tion is the use of the TIMES/MINUS key.

Let's combine operations and add two squared numbers--5 squared + 8 squared.
First enter 5 and press the SQUARE key. That will give us 25. Then enter
the plus operator (+) followed by the number 8. The expression we have thus
far is 25 + 8. Press the SQUARE key. The 8 is squared, and the result, 64,
is displayed. However, the expression that we now have is 25 + 64. Press the
EQUALS key and the operation is completed--25 + 64 = 89.

To add the squares of 5 and 8, do the following:

Press 5 SQUARE + 8 SQUARE EQUALS

You can square a number even in the midst of an operation. The second operand,
in the above case 8, is acted on by the squaring function, and is replaced with
a new operand--64.

The inverse function of calculating squares is calculating square roots. The
square root function is another unary function. Calculating a square root uses

the same keys, except that you must perform the inverse of the squaring function by pressing the INVERSE key. Assuming you want to find the square root of 900. Press the INVERSE key (the "Z" key on the typewriter keyboard) and then press the SQUARE key. A new message appears on the screen and is spoken: "Square Root," letting you know that the INVERSE function has been recognized and the function of the SQUARE key changed to function as a SQUARE ROOT key. The answer to the problem of the square root of 900, which is 30, is displayed and spoken.

To calculate the square root of 900,

Press ⑨ ⓪ ⓪ [INVERSE] [SQUARE]

Section 4-2: Trigonometry

The trigonometry function keys are along the top row of the keyboard. The first key in this group, the DEGREE/RADIAN key is the "1" key on the standard typewriter keyboard. The next three keys to the right of the DEGREE/RADIAN sign are the TANGENT key (corresponding to the "2" key on the typewriter), the COSINE key (corresponding to the "3" key on the typewriter), and the SINE key (corresponding to the "4" key on the typewriter keyboard). The DEGREE/RADIAN key determines which trig mode you are in. (See Figure 2-4-1)

Press the DEGREE/RADIAN key once. It will announce and display its setting. Press it again and it will change to the other possibility and announce its new setting. Set the DEGREE/RADIAN key to Radian mode.

If you want to calculate the cosine value of Pi over two, enter the value for Pi, which is 3.141 into the calculator. Divide it by 2. Press the COSINE key. The answer to this problem is 1; however, remember that the value we used for Pi was a rounded-off approximation, so the answer displayed and spoken is slightly smaller than the actual value—0.99939083.

To calculate the cosine value of Pi over two,

Press ③ [Decimal] [Point] ① ④ ① [DIVIDE] ② [COSINE]

NOTE: The reason we couldn't have simply entered 3.141/COSINE and hit the EQUALS key is that the division had to have been completed first. If we had done it that way, we would have gotten 3.141 divided by the Cosine of 2. Remember that unary functions in the middle of a calculation (and the Cosine function is a unary function) act immediately on the displayed number).

THE CALC-TALK KEYBOARD - TRIG KEYS

Figure 2-4-1
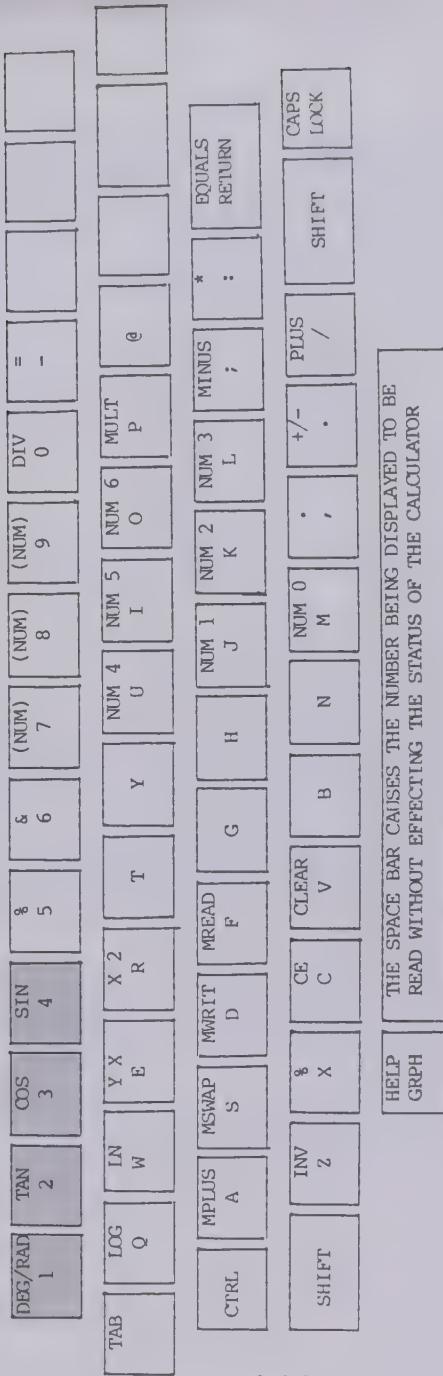
NOTE: The RETURN key acts as the calculator's EQUALS key.

Calc-Talk's Trig Keys Are the 1, 2, 3, 4 Keys of the Typewriter.

Change from the Radian mode to the Degree mode. Press the DEGREE/RADIAN key
until you hear SMALL TALK speak "Degree mode." The difference between Radian
mode and Degree mode is how Calc-Talk interprets the number it is to interpret.
In the Radian mode, for example, Calc-Talk interprets the numbers received as
representing angles having been entered in radian measure. In the Degress mode,
the angles entered are read as being expressed in degrees. Therefore, in De-
gree mode, if you enter 90 and press the SINE key, the answer is "1", the sine
of 90 degrees. To determine the sine of 45°, enter 45 and press the SINE key.
The answer is 0.70710678.

To determine the sine value of 90°

Press [9] [0] [SINE]

To determine the sine value of 45°

Press [4] [5] [SINE]

Determining Cosine value is done similarly. To find the Cosine value of 180°,
enter 180 and press the COSINE key. All the trig functions work this way.
They are unary functions.

To determine the Cosine value of 180°

Press [1] [8] [0] [COSINE]

Inverse trig functions are determined by using the INVERSE key. When combined
with the trig functions fo sine, cosine, and tangent, Calc-Talk determines and
speaks the inverse functions--ARCSINE, ARCCOSINE, and ARCTANGENT.   For exam-
ple, if the cosine of 180° is −1, then the inverse, or arccosine of −1 is equal
to 180°. Calculate the arccosine of −1. Enter 1, press the TIMES/MINUS key to
change the sign of the 1, press the INVERSE key, and then press the COSINE key.
Because the COSINE key was preceded by the INVERSE key, you should have heard
Calc-Talk speak the message "arccosine" to confirm the operation. The answer
180 is displayed and spoken.

To determine the arccosine of −1,

Press [1] [TIMES/MINUS] [INVERSE] [COSINE]

You should practice with the trig and trig inverse functions until these unary
operations become familiar.

Section 4-3: Logarithms

Two log functions are available--natural logs and common logs. Like the trig functions, these are also unary functions. Determining the natural log of a number is easy. Enter the number, for example, 2.7182, and press NATURAL LOG ("W" on the typewriter keyboard). The answer is 0.9999699, which is the rounded-off approximation of 1. To evaluate the common log of 2, press 2 and the COMMON LOG key ("Q" on the typewriter keyboard). The answer is 0.30102999. (See Figure 2-4-2)

To determine the natural log of 2.7182,

Press 2 DECIMAL POINT 7 1 8 2 NATURAL LOG

To determine the common log of 2,

Press 2 COMMON LOG

Use the INVERSE key with logs. The inverse of the NATURAL log is the function E to the X. The inverse of the common log is 10 to the X.

Section 4-4: Other Exponents and Roots

One of SMALL TALK's most powerful controls is the $\widehat{Y}$ X key. This key enables you to raise any number to any power. Its inverse enables you to take any root of any number. These operations are binary functions. As in adding, subtracting, and other mathematical operations, two operands are separated by an operator, or operation symbol. To get the answer to a binary function, you also press the EQUALS sign. (See Figure 2-4-3)

When we square a number, we are raising it to a power--the power of 2. In order to raise a number to the second power, simply square it using the SQUARE key. However, to raise a number to the third, fourth, or nth. power, you supply the "Y" (the first part of the $\widehat{Y}$ X operator) and the "X" (the second part of the $\widehat{Y}$ X operator).

We will raise 5 to the third power--5^3 Enter 5, the base number, press the $\widehat{Y}$ X key, enter the exponent; in this case 3, and press the EQUALS key. Your answer is 125. To raise 3.5 to the 4th. power (3.5), Enter 3.5, press the $\widehat{Y}$ X key, press 4, and press the EQUALS key.

To raise 3.5 to the 4th. power,

Press 3 DECIMAL POINT 5 $\widehat{Y}$ X 4 EQUALS

THE CALC-TALK KEYBOARD - LOG KEYS

Figure 2-4-2

THE CALC-TALK KEYBOARD - LOG KEYS diagram showing keys:

TIME/DATE | MENU | BREAK | KEYB | ON | RATE | PUNCT | PITCH
SCRN | OFF

DEG/RAD 1 | TAN 2 | COS 3 | SIN 4 | % 5 | & 6 | (NUM) 7 | (NUM) 8 | (NUM) 9 | DIV 0 | = -

TAB | LOG Q | LN W | Y X E | X 2 R | T | Y | NUM 4 U | NUM 5 I | NUM 6 O | MULT P | @

CTRL. | MPLUS A | MSWAP S | MWRIT D | MREAD F | G | H | NUM 1 J | NUM 2 K | NUM 3 L | MINUS ; | * :

SHIFT | INV Z | & X | CE C | CLEAR V | B | N | NUM 0 M | : , | +/- . | PLUS / | EQUALS RETURN

SHIFT | CAPS LOCK

HELP GRPH

THE SPACE BAR CAUSES THE NUMBER BEING DISPLAYED TO BE READ WITHOUT EFFECTING THE STATUS OF THE CALCULATOR
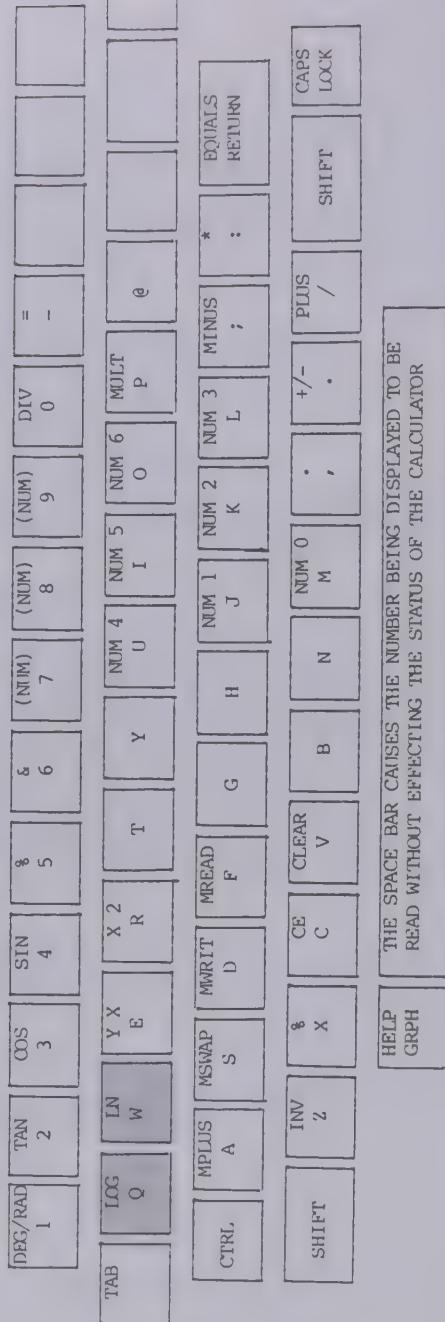
NOTE: The RETURN key acts as the calculator's EQUALS key.

Calc-Talk's Log Keys Are the Q and W Typewriter Keys

THE CALC-TALK KEYBOARD – $\sqrt{X}$ AND X^2 KEYS

Figure 2-4-3

Function keys: TIME/DATE | MENU | BREAK | KEYB (SCRN) | ON (OFF) | RATE | PUNCT | PITCH

Number row: DEG/RAD 1 | TAN 2 | COS 3 | SIN 4 | % 5 | & 6 | (NUM) 7 | (NUM) 8 | (NUM) 9 | DIV 0 | = −

Row: TAB | LOG Q | LN W | $\sqrt{X}$ E | X^2 R | T | Y | NUM 4 U | NUM 5 I | NUM 6 O | MULT P | @

Row: CTRL | MPLUS A | MSWAP S | MWRIT D | MREAD F | G | H | NUM 1 J | NUM 2 K | NUM 3 L | MINUS ; | * :

Row: SHIFT | INV Z | % X | CE C | CLEAR V | B | N | NUM 0 M | +/− . | . , | PLUS / | EQUALS RETURN

CAPS LOCK | SHIFT

HELP GRPH

THE SPACE BAR CAUSES THE NUMBER BEING DISPLAYED TO BE READ WITHOUT EFFECTING THE STATUS OF THE CALCULATOR
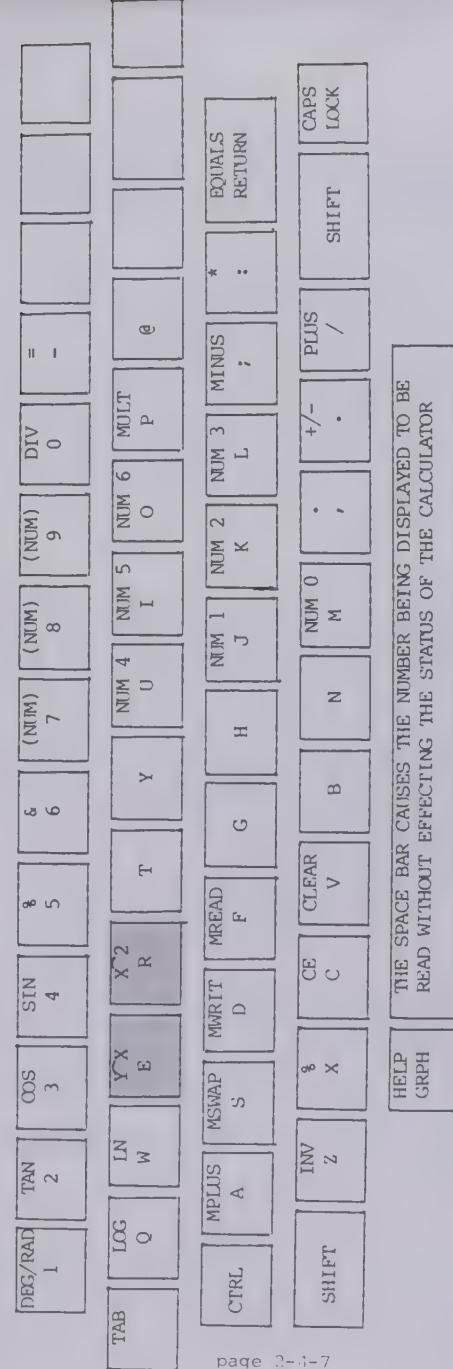
NOTE: The RETURN key acts as the calculator's EQUALS key.

$\sqrt{X}$ and X^2 Keys Are the E and R Typewriter Keys

With the INVERSE and Y^X keys, we can determine roots. The inverse of Y^X is known as the nTH ROOT. For example, to take the 4th. root of 64, enter 64, press the INVERSE key, press the Y^X key, then enter 4, and press EQUALS. The answer is 4. The 4th. root of 64 is 4; also, 4 raised to the 4th. power is 64.

To determine the 4th. power of 64,

Press $\boxed{6}$ $\boxed{4}$ $\boxed{\text{INVERSE}}$ $\boxed{Y^X}$ $\boxed{4}$ $\boxed{\text{EQUALS}}$

You can also use the Y^X function and its inverse on the second operand of an operation already in progress. If you were to enter "2 + 2 Y X 7 =" you would get 130 as the answer. When the EQUALS key was pressed, the second operand (in this case 2) was raised to the 7th. power, and then that result was substituted for the original operand. Thus, instead of 2 being added to 2, 128 was added to 2. Calc Talk then completed the new binary operation.

Section 4-5: Percent and 1/X

There seems little reason to rhapsodize about the usefulness of the percent function. For example, you can use the percent function to figure sales tax, income tax, sales savings, interest rates, and much more. The percentage function can be used as a unary operation; however, its real power derives from its use with the second operand in an expression.

The simplest percent operation is finding the specific percentage of something. For example, if you want to know what 25% of 40 is, simply enter 40, press the TIMES key, enter 25, press the PERCENT (the "X" key on the typewriter keyboard) and the result, 10, will appear and be spoken. Let's try another one: What is 75% of 200? Enter 200, TIMES, 75, PERCENT, and listen to the answer: 150.

If you want to find 75% of 200,

Press $\boxed{2}$ $\boxed{0}$ $\boxed{0}$ $\boxed{\text{TIMES}}$ $\boxed{7}$ $\boxed{5}$ $\boxed{\text{PERCENT}}$

Assume you're buying an item for $250.00, and you have to add 6.5% sales tax. Here's how to do it. Enter 250. Because we want to add the amount of tax to the purchase price, enter the +. Because we want 6.5%, press 6.5 and press the PERCENT key. The amount of tax (the 6.5%) will be displayed and spoken—16.25. 16.25 is 6.5% of 250. Then press EQUALS and the $16.26 will be added to the $250.00 and $266.25 will be displayed and spoken.

To determine the total price of an item costing $250.00 with an additional
6.5% sales tax,

Press $\boxed{2}$ $\boxed{5}$ $\boxed{0}$ $\boxed{+}$ $\boxed{6}$ $\boxed{\text{DECIMAL POINT}}$ $\boxed{5}$ $\boxed{\text{PERCENT}}$ $\boxed{\text{EQUALS}}$

The same procedure works to determine a discount, or a percentage subtracted.
For example, you want to buy a coat that costs $90.00 and it is on sale at 20%
off. Enter the original amount by pressing 90; press the operand —; enter 20,
press PERCENT, and press EQUALS. The result is $72.00--the amount you pay for
a $90.00 coat with 20% off.

To determine the final cost after 20% has been subtracted from $90.00,

Press $\boxed{9}$ $\boxed{0}$ $\boxed{-}$ $\boxed{2}$ $\boxed{0}$ $\boxed{\text{PERCENT}}$ $\boxed{\text{EQUALS}}$

SMALL TALK gave you the confirmation message that 20% of 90 was 18, then it fin-
ished the calculation when you pressed EQUALS, giving you the final, discounted
price of the coat.

Although technically not the mathematical inverse of percent, you do have an ad-
ditional function available by using the INVERSE key in combination with PERCENT.
This additional function is the 1/X--the RECIPROCAL. The reciprocal function is
a unary function. Performing the reciprocal function within a larger operation
permits the computation of fractions. For example, if we wanted to add 1/12 +
1/6, we could do it with reciprocals.

To add 1/12 and 1/6, do the following. Enter 12, press the INVERSE key and then
the PERCENT key. Calc-Talk will display and speak "one over x . . . 0.08333333"
--which is saying 1 over 12 (1/12--the reciprocal of 12) is, in decimal notation
0.08333333. Now enter +, enter 6, again press INVERSE, and again press PERCENT.
Calc-Talk will display and speak "6, INVERSE, 1 over X, 0.16666666." Finally,
press EQUALS, and Calc-Talk will display and speak "equals 0.25." This is the
answer to the problem of adding 1/12 and 1/6; of course, 0.25 = 1/4.

To add 1/12 and 1/6,

Press $\boxed{1}$ $\boxed{2}$ $\boxed{\text{INVERSE}}$ $\boxed{\text{PERCENT}}$ $\boxed{+}$ $\boxed{6}$ $\boxed{\text{INVERSE}}$ $\boxed{\text{PERCENT}}$ $\boxed{\text{EQUALS}}$

The answer, one-fourth, is displayed and spoken in decimal form--.025.

To subtract 1/4 from 1/2,

Press $\boxed{2}$ $\boxed{\text{INVERSE}}$ $\boxed{\text{PERCENT}}$ $\boxed{-}$ $\boxed{4}$ $\boxed{\text{INVERSE}}$ $\boxed{\text{PERCENT}}$ $\boxed{\text{EQUALS}}$

The answer, one-fourth, is displayed and spoken in decimal form--.025.

To multiply 1/6 by 1/5 by 1/8

Press $\boxed{6}$ $\boxed{\text{INVERSE}}$ $\boxed{\text{PERCENT}}$ $\boxed{\text{TIMES}}$ $\boxed{5}$ $\boxed{\text{INVERSE}}$ $\boxed{\text{PERCENT}}$ $\boxed{\text{TIMES}}$ $\boxed{8}$ $\boxed{\text{INVERSE}}$ $\boxed{\text{PERCENT}}$ $\boxed{\text{EQUALS}}$

The answer, 0.0041666 is displayed and spoken.

If we combine functions, and want, for example, to divide 1/2 by the square of 2, (1/2 ÷ 4), enter 2, enter INVERSE, enter PERCENT; this, of course, gives us 1/2-the reciprocal of 2. Then enter DIVIDE, 2, SQUARE, and EQUALS. Calc-Talk displays and speaks the answer 0.125, or 1/8, which is the answer to the problem of dividing 1/2 by 4 (the square of 2).

To calculate the problem of dividing 1/2 by the square of 2,

Press ②　INVERSE　PERCENT　DIVIDE　②　SQUARE　EQUALS

Similarly, to divide the square root of 64 by the square of 4,

Press ⑥ ④　INVERSE　SQUARE　DIVIDE　④　SQUARE　EQUALS

Essentially, this problem means dividing the square root of 64 which is 8, by the square of 4, which is 16; 8 divided by 16 = 8/16 = 1/2. SMALL TALK reveals the answer as the decimal 0.5.

Section 4-6: Summary of Scientific Notations

The scientific functions we've outlined in this section are only some of the functions that Calc-Talk performs. You will discover many others yourself. Most of these functions can be combined, so that tangents and cosines, for example, may be added, subtracted, multiplied, and divided. Additionally, logs may have the usually mathematical operations performed. In short, scientific functions (most of them unary) may be combined within binary functions. You will, as your competence and confidence with the Calculator develop, find innumerable uses for Calc-Talk.

NOTE: Be sure that as you work with the Calculator, you remember that the numbers for the Calculator are the Calculator function keys on the right side of the keyboard. If you are accustomed to working with the standard typewriter keyboard, there may be a tendency to automatically go to the typewriter keyboard numbers along the top row. SMALL TALK will, of course, immediately tell you that you are not getting the number you want (numbers 7,8, and 9 are exceptions, being, of course, the same keys for typewriter and calculator functions).

You have had an introduction to unary and binary functions, arithmetical operations and operands and operation signs, square roots, squares, trig functions, logarithms, powers, percent, and reciprocal functions. Expand on what you now know.

PART III - THE WORD PROCESSOR

Section 1: INTRODUCTION TO WORD-TALK

Section 1-1: Getting Familiar with Word-Talk

Word-Talk, SMALL TALK's built-in word processing program allows you to take
notes in class and at lectures, write letters leisurely at home or while in
the office, write reports and other business news in the office, in the field,
and even in an airplane. Word-Talk truly demonstrates the versatility, power,
and portability of SMALL TALK.

Word Talk is the standard word processing program developed by Computer Aids
Corporation not only for SMALL TALK, but for IBM PC and Apple personal compu-
ters. With Word Talk, word processing is available at the press of a button.
Word-Talk's sophisticated array of features allows you to insert and delete
text, move passages within a document, and search for specific words and replace
them. If you want to save your work permanently, you have the built-in micro-
casette and the built-in printer. You may transfer your work from SMALL TALK
to another computer and even transfer work from another computer to SMALL TALK.
Word-Talk operates from a menu system. If you are unfamiliar with menus, recall
that we mentioned during our discussion of the Calculator that you used a menu
to enter the Calculator mode when you chose "C" and pressed it to enter the
Calculator. Had you chosen to press "W", you would have entered the Word Pro-
cessing mode. You made a "menu selection" for what you wanted. We will cover
all the menus you'll encounter with SMALL TALK in this part of the manual.

Section 1-2: Turning the Word Processor On and Off

When you turn SMALL TALK on, the System Menu appears, giving you the option of
activating the Calculator (pressing "C") or activating the Word Processor by
pressing "W". If you select "W", you will hear the following message:

WORD-TALK (TM) X.X

This is Word-Talk's way of identifying itself. The message also appears exactly
like this on the LCD display. Remember and record the number (represented by
X.X). Should you ever require technical assistance for Word-Talk, this number
will be important.

After pressing "W", you will have entered Word Talk; you'll see Word-Talk's
main menu displayed on the screen as well as hear the title. To turn Word-
Talk off, simply hit the MENU key above the keyboard's "2". This is the key
between the BREAK key and the TIME/DATE key (the System Function keys). If
you exit Word-Talk by pressing the MENU key, you will not affect any text
you've entered into the memory. When you return to Word-Talk, your text will
be there. You can turn Word-Talk off completely without effecting the text.
(See Figure 3-1-1)

SMALL TALK KEYBOARD -- TURNING WORD TALK ON

Figure 3-1-1

From Main Menu, Pressing W Enters Word Talk
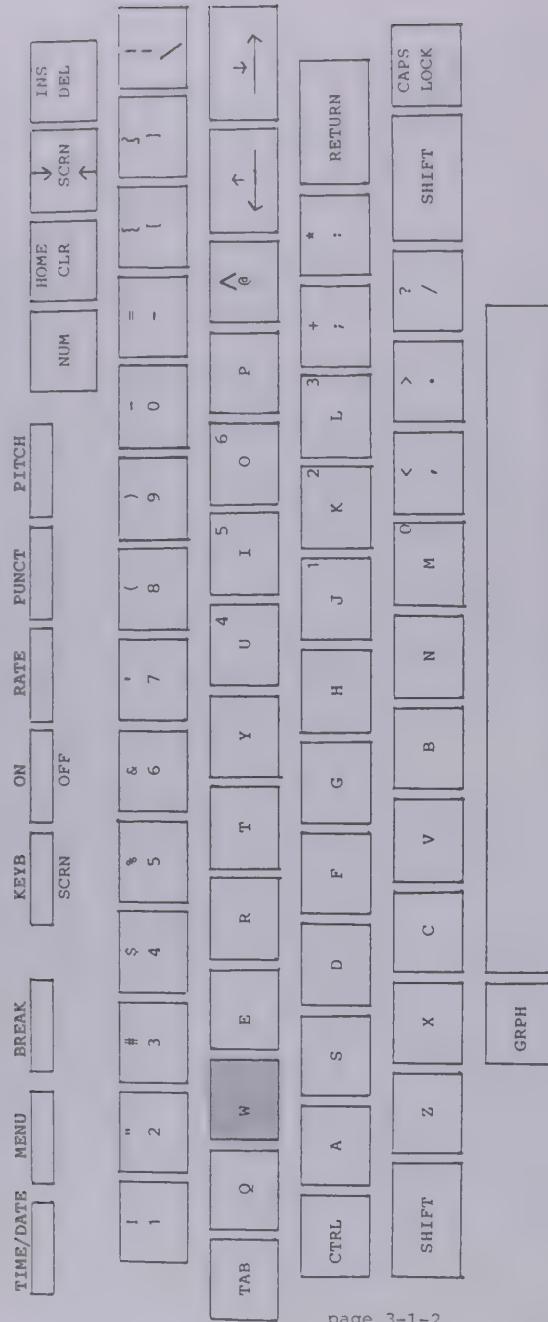
Section 2: WORKING WITH WORD-TALK

Section 2-1: Basic Tutorial

The first thing to do is get right into creating and printing a document.

NOTE: We call this tutorial interactive, meaning that you will be getting hands-on experience and practice with what is probably the most important part of the manual: please follow the instructions as carefully as possible, and please perform the operations as we run through them.

Turn on SMALL TALK and you'll see the System Menu:

        SMALL-TALK (TM) 1.X
        W=WORD PROCESSOR
        C=CALCULATOR

Of course, this is the starting point every time SMALL TALK is activated. If you want to write a three-word memo or write a novel the size of War and Peace, begin by pressing "W". Word-Talk will identify itself by saying "WORD-TALK (TM) X.X." The specific version number you have will be the last number spoken. Then Word-Talk's main menu will appear:

                        - MAIN -
        I = INIT,   E = EDIT
        F = FORMAT,   P = PRINT
        T = TAPE,

by passing the "W" "I" "Y" process

Select from this menu one of these options. If you want to hear all the options repeated, press the SPACE BAR.

Section 2-2: The Editor

The Editor is what you need to enter when you want to create a new document. After you have called up the Main Menu, simply press RETURN. This is how you enter the Editor. You can now begin your document. The CURSOR (a small underlining character) always appears where the next character will be entered on the screen. After you press RETURN, the cursor positions itself in the first column of the first line available for typing. The address for this position is Column 1, Line 1, Page 1. Word Talk assumes you will want to begin here, so the cursor, or pointer position is built-in. It is a Default position, assumed by the computer unless another value is selected.

Press CTRL-A and SMALL TALK will tell you where the cursor is. SMALL TALK will say, "C-1 L-1 P-1." Push the SPACE BAR three times, and SMALL TALK will now tell you, when you press CTRL-A, that the cursor is now at "C-4 L-1 P-1." The cursor has moved to the fourth space (C-4), but is still on the first line of the first page . . . (L-1 and P-1). (See Figure 3-2-1)

SMALL TALK KEYBOARD – CONTROL FUNCTIONS

Figure 3-2-1

Address: CTRL-A   Backspace: CTRL-H   Front Space: CTRL-U   Line Down: CTRL-J   Up Line: CTRL-K
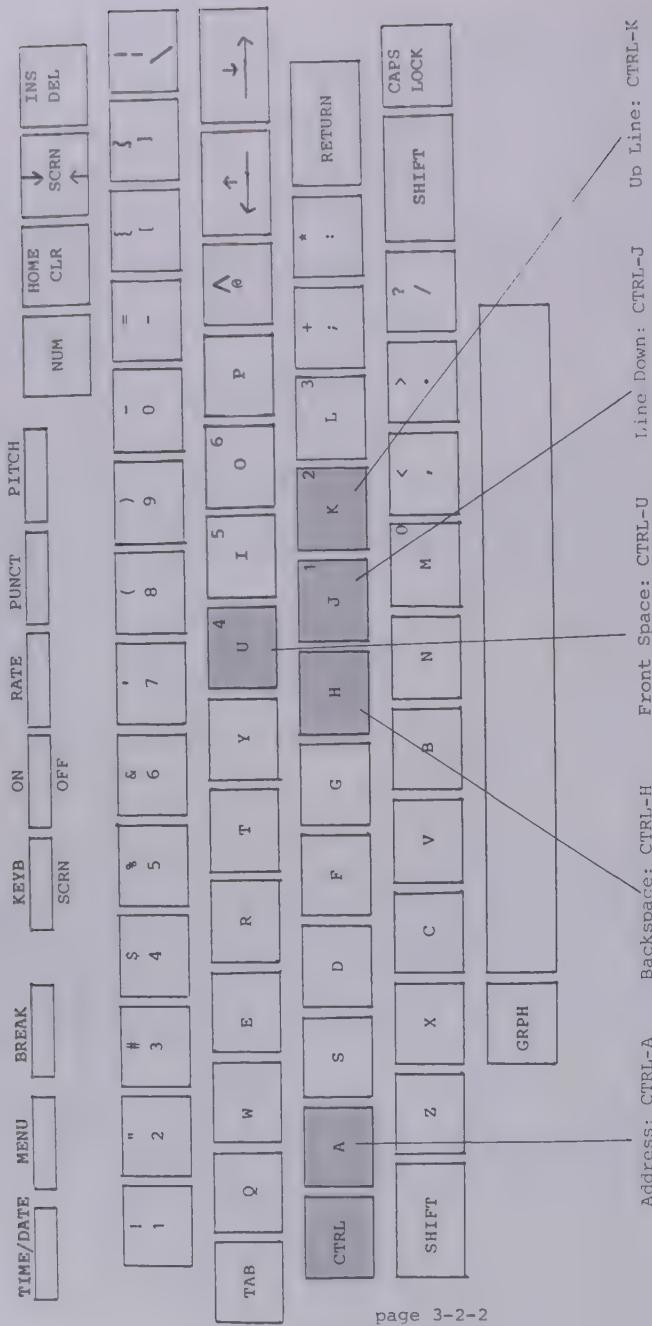
To remember what this function does, it may be convenient to remember that the "A" in CTRL-A stands for "Address." Most CONTROL Characters stand for something you can easily remember.

Control commands are typed by holding down the CONTROL key (the key immediately left of the "A" key) and, while holding the CONTROL key down, pressing the accompanying letter. Then release both keys simultaneously. This Control function is one you'll be using continually while in the Editor.

Begin by typing the familiar line, "Mary had a little lamb." Press the SHIFT key in order to capitalize the "M" in Mary; press "a", "r", "y", SPACE BAR, "h", "a", "d", SPACE BAR, "a" and continue. As each character is typed, it appears on the screen and is spoken aloud. The upper case letters are voiced in a slightly higher pitch for audible identification. You can easily observe this by typing, for example, a capital letter followed by the same lower case letter.

If you make a mistake, simply backspace and type the correct letter. Backspacing is another Control function. Simply press and hold the CONTROL key while you press "H". Pressing CTRL-H backspaces. The cursor will move back one space, or column, to the left. The cursor may, of course, be moved in directions--right, down, and up. These are also accomplished by typing in control commands. CTRL-U is the reverse of backspace; it moves the cursor one colum right; CTRL-J moves the cursor down the page one line; CTRL-K moves it up one line at a time. (See Figure 3-2-1)

Thus far, we have covered the following control commands:

```
        CTRL-A      "Address" (tells you where the cursor is)
        CTRL-H      "Backspacing" (moves cursor one space backwards)
        CTRL-U      "Front Spacing" (moves cursor one space to the right)
        CTRL-J      "Line Down" (moves cursor down one line)
        CTRL-K      "Up Line" (moves cursor up one line at a time)
```

When you backspace, each character (even spaces) is echoed by the voice. Whenever the cursor commands have been activated, the Editor will echo the character that the cursor has landed on.

Continue, if you have not already, to type and finish the line "Mary had a little lamb." Observe what occurs as you continue to type. You will hear a two-tone signal and perhaps part of a word. What happened was that the word you were typing, in this case "lamb," did not completely fit on the line and part of it was brought down to the next line. Computer people call this "word-wrap." However, don't let "word-wrapping" intefere with your typing. Continue without stopping. Nothing typed will be lost, although the voice may lag slightly behind. The keyboard is buffered by the Editor, meaning that the Editor is holding everything that's been typed, even if the voice is lagging behind.

A buffer is a temporary holding area. Characters typed go to the buffer first and then to the text. The two tones you heard when you reached the end of the line were an announcement that you were moving down to the next line. The reverse of this tone tells you that you have moved up a line. Practice typing CTRL-J and CTRL-K and listen to the differences in tones as you go up and down lines.

SMALL TALK's LCD screen should be thought of as showing one of the lines in the text at a time. The number of characters displayed on the screen is determined by the margins you set (setting margins is discussed in Section 3-3: Formatting). Word-Talk's default right margin setting is 25; this means that the screen will display only 24 columns of a line; setting the right margin at 81, however, gives you a display of 80 columns--the four full lines of the LCD screen. Therefore, depending on your margin settings, SMALL TALK shows one line of text split into a number of "twenty-column" rows. Words may be split awkwardly on the screen, but they will not be split in the text.

Another important Control command you will want to familiarize yourself with at this point is the CTRL-L. The "L" stands for "Line Review," and no matter where the cursor is located within the line, when you enter CTRL-L, the entire line will be read back to you. The cursor does not move in this command. (See Figure 3-2-2)

For example, after having typed "Mary had a little lamb," entering CTRL-L reads the line back to you. Press CTRL-L and you should hear,

                    "Mary had a little lamb"

If you want the entire poem read back to you, enter another control function--CTRL-S. This command reads all the text entered to this point; actually, CTRL-S reads a maximum of twenty lines of text up to the line currently shown on the LCD screen. If you don't hear the entire poem, move the cursor to the end of the text and try again. The "S" stands for for "Screen Review" and, like the CTRL-L, it doesn't matter where the cursor happens to be; the function will not affect the cursor. In the case of Mary and her lamb, the same effect is achieved by typing either CTRL-L or CTRL-S. The poem is only one line long; therefore, a "Screen Review" will accomplish the same thing as a "Line Review." (See Figure 3-2-2)

If you want to leave the Editor, you press another key--the ESCAPE key. The ESCAPE key is located on the row above the home row and is directly above the RETURN key. There are two "larger than normal" keys above the RETURN key, and each has arrows on it. The inner key with the arrows pointing up and to the left is the ESCAPE key. Pressing the ESCAPE key allows you to escape or exit from the Editor, and get back to the Main menu. When you hit ESCAPE, the LCD screen reveals the Main menu and the voice says "main." (See Figure 3-2-3)

SMALL TALK KEYBOARD — CONTROL FUNCTIONS

Figure 3-2-2

Screen Review: CTRL-S

Line Review: CTRL-L
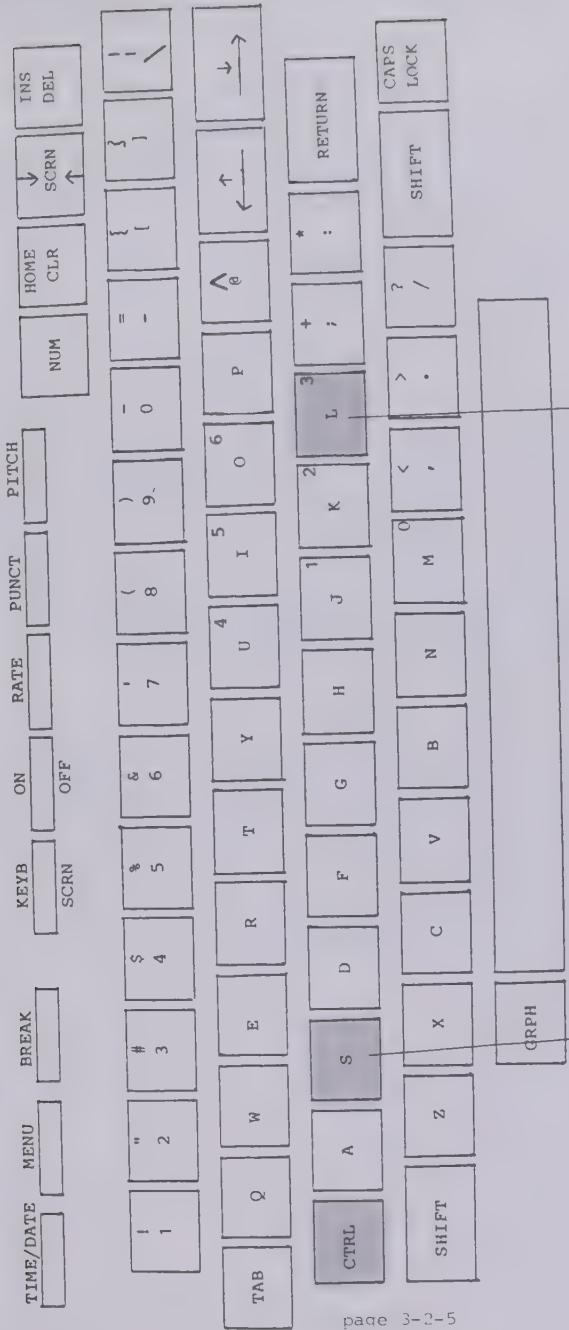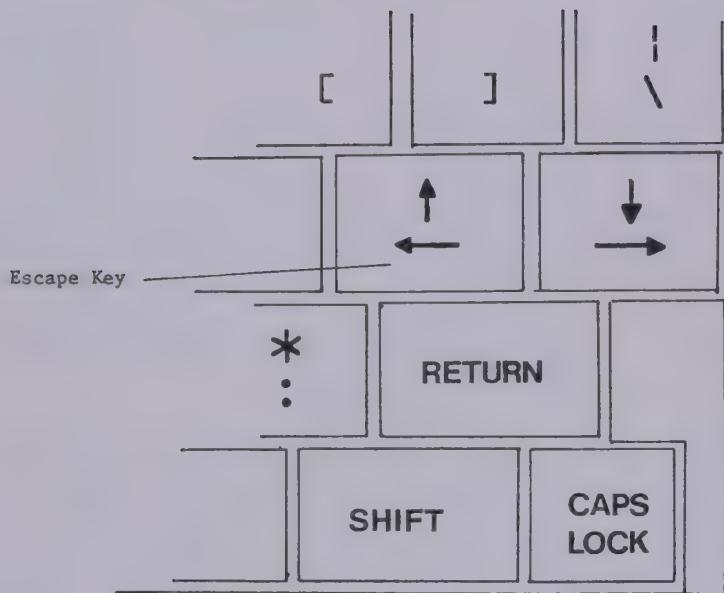
Section 2-3: Printing

Word-Talk will, by default, use the micro-printer when told to print. In-
formation on using peripheral printers is contained in Section 8 of the
manual.

To print, select "P" = PRINT. This will reveal the PRINT MENU, which looks
like this:

                         - PRINT -
                    D=DEVICE, P=PARMS
                    G=GO

Hitting the SPACE BAR reviews your options within this menu. To begin print-
ing, prss "G"--the "GO" option. When the printing is finished, the PRINT MENU
returns; if you want to cease printing in the middle of a document, simply
press BREAK (the narrow key to the right of the MENU key above the typewriter
keyboard). The LCD screen will return to the PRINT MENU and SMALL TALK's
voice will echo "Print." When you have finished printing and you want a copy
of your work, simply grasp the end of the printer tape paper, pull it out about
one inch, and tear it toward you and against the serrated edge of the plastic
cutting bar. Don't use the PAPER FEED key (located above the BREAK key). The
PAPER FEED is used when loading a new roll of paper or in order to advance the
paper slowly.

NOTE: DON'T PULL THE PAPER WHILE THE PRINTER IS PRINTING. THIS COULD DAMAGE
        THE PRINTER.

Press the ESCAPE key and return to the main menu. Recall that you entered the
Print menu from the Main menu, so the ESCAPE key is necessary to return to
where you came from. Always use the ESCAPE key to return to the previous menu
in Word Talk.

Section 3: THE EDITOR TUTORIAL

Section 3-1: Initializing

If you want to begin a new writing project, previous projects have to get out of the way. In this case, you've created and printed a document already, "Mary had a little lamb." On the Main menu, select the I option. I=INIT stands for initializing and this clears everything out of SMALL TALK's memory allowing you to begin fresh. However, it is possible that "I" could be hit accidentally from the Main menu, wiping out all your work. Certain protections have been built in to prevent this catastrophe. Whenever you select this option, the LCD screen and the voice ask you, "SURE?" This allows you to say "yes," I am sure or "No," don't do it. If you are certain you do want to erase the previous memory, press "Y". If you are not sure, and you want to review the contents of the previous memory, or you have hit "Y" accidentally, then press "N". Pressing "N" returns you to the Main menu. Pressing "Y" erases the memory of the previous document and returns you to the Main menu.

Section 3-2: Entering the Editor

You know you can enter the Editor from any menu simply by pressing the RETURN key. When you enter the Editor, the cursor will return to the position that you left it the last time you were editing and SMALL TALK will announce the character upon which the cursor landed.

However, here, where we're starting fresh with a new document, having entered the editor after initializing, the cursor will come to the first position available for writing--the default position--Column 1, Line 1, Row 1.

Section 3-3: Formatting

Let's begin to learn about formatting by composing a letter. We'll begin by writing a letter to your boss demanding more money, shorter hours, longer vacations, and generally better working conditions.

Although we can print the letter out on SMALL TALK's built-in printer, we will eventually want to print it on full-size paper, so we will have to set margins in accordance with the larger paper, differently than those set from the defaults established for the micro-printer. Margins and other formatting considerations are controlled by the Format Menu. From the Main Menu, select the F=FORMAT option. You will see a screen that looks like this:

```
            -FORMAT-
     L=LENGTH, S=SPACING,
     T=TABS,   M=MARGINS
```

Let's assume our full-sized paper is standard 8 1/2" x 11", and that we'll be using Pica type. Pica type means 66 lines to the page, so select the L=Length option by pressing "L" on the keyboard. A prompt will appear on the screen and will be read: "LENGTH=24." Type in "66" right over the "24" and press the RETURN key. You've set a new value.

Now let's set the margins. Return to the Format menu by pressing RETURN. Press "M" for margins and you'll see and hear the following menu:

                    -MARGINS-
            L=LEFT,   R=RIGHT,
            T=TOP,   B=BOTTOM

Select any margin individually: press 6 for top, 61 for bottom, 10 for left, and 78 for right. You will have set margins that will begin your first line six lines from the top and 5 lines from the bottom (61 lines down from the top subtracted from 66 lines on the page). You will have set a left margin 10 spaces in from the left side of the page and a right margin 6 spaces from the left side of the page (78 spaces from the left subtracted from 84 Pica spaces on a page). Setting up other formats will be discussed in greater detail in Section 6.

Enter the Editor and begin your letter. Begin by typing the date: October 25, 1985. Press the RETURN key to go to the next line. Type the address:

Mr. Boss
Big Office
Upstairs, 5th. Floor 00000

At the end of each line press RETURN and then type in the salutation:

Dear Mr. Boss:

Press RETURN. Begin the letter by pressing the TAB key (located directly left of the "Q" key on the keyboard. The TAB key will indent the first line 4 spaces, and you'll hear Word Talk say "Tab 4 space." The TAB key will move the cursor across the line of text to the next successive tab stop. Each time you press the TAB key, the cursor moves right one tab stop. Tab stops are set by default first at Column 4 and then at every fifth column . . . 9, 14, 19, etc. (See Figure 3-3-1)

Type the following letter:

        Unless you pay me more money, give me shorter hours, and allow me longer vacations, I will have to quit. It seems to me that in 1985, to be working for $1.82 an hour, 14 hours a day, 6 days a week, and receiving a 20-minute vacation, is somehow, not right. I would like to request a raise to $2.00 an hour, my work day shortened to 12 hours, and vacations of at least an hour.

Tab Key
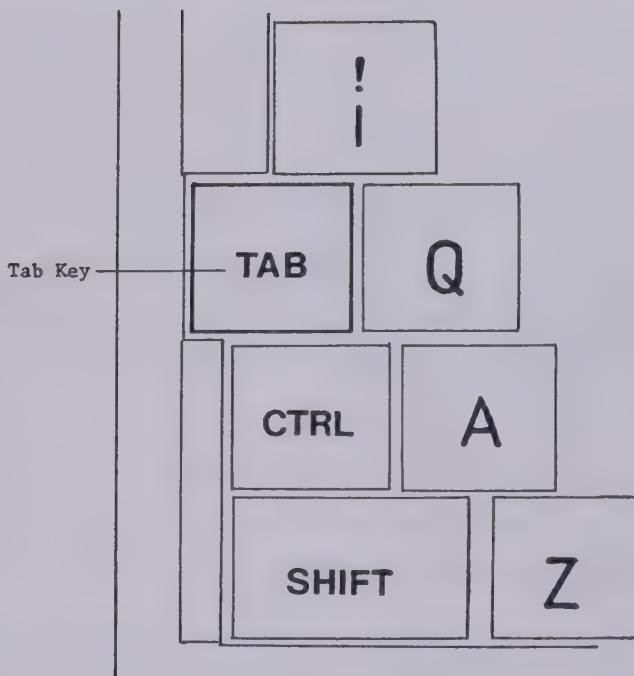
Type the closing: Sincerely, Bill

You have just written a letter which, although it may not get you what you request, will at least have been formatted correctly.

To hear the entire letter read back, press CTRL-S. This review serves a very useful review function. You can edit for context before you edit for typographical errors.

Section 3-4: Moving Around in the Text

Let's look more closely at the letter you just wrote. The beginning of the letter, in fact, the point at which you start writing anything is called the "beginning of file." A collection of information, the writing itself, is called a "file." The file is the text in SMALL TALK's memory. To move directly to the beginning of a file, press the COMMAND key (you were introduced to the COMMAND key in the Calculator). If you have forgotten, the COMMAND key is the key directly left of the SPACE BAR and is labelled "GRPH." Similar to the SHIFT and CONTROL keys, the COMMAND key enhances other functions and is always used in conjunction with other keys. (See Figure 3-3-2)

The COMMAND key is labeled GRPH. It is usually struck with the thumb of the left hand. Holding the COMMAND key and using it with CTRL-K is the command to go to the beginning of a file. Using the COMMAND key with CTRL-J goes directly to the end of a file. Experiment by going to the beginning of the file and using CTRL-A to hear the address. Go to the end of the file and again check the address. (See Figure 3-3-3)

To go to the beginning of a file,

Press and hold GRPH, Press and hold CTRL, Press K, Release all 3 keys

To go to the end of a file,

Press and hold GRPH, Press and hold CTRL, Press J, Release all 3 keys

When you're at the top line, use the CTRL-L Line Review Command to hear the date you entered earlier. At the bottom line, activate the CTRL-L again and you'll hear the closing of the letter.

Return to the beginning of the file where you entered the letter's date and experiment with some more options the COMMAND key affords you. You have returned to the beginning of the file. This is the line with the date. You can move your cursor over to the year by frontspacing with the CTRL-U command, but that takes time. However, if you press the COMMAND key down and hold it while pressing CTRL-U, the cursor will jump to the first character of the next word.

COMMAND (GRPH) KEY

Figure 3-3-2

Command Key

FILE COMMANDS

Figure 3-3-3

GRPH/CTRL-J . . . Beginning of File
GRPH/CTRL-K . . . End of File
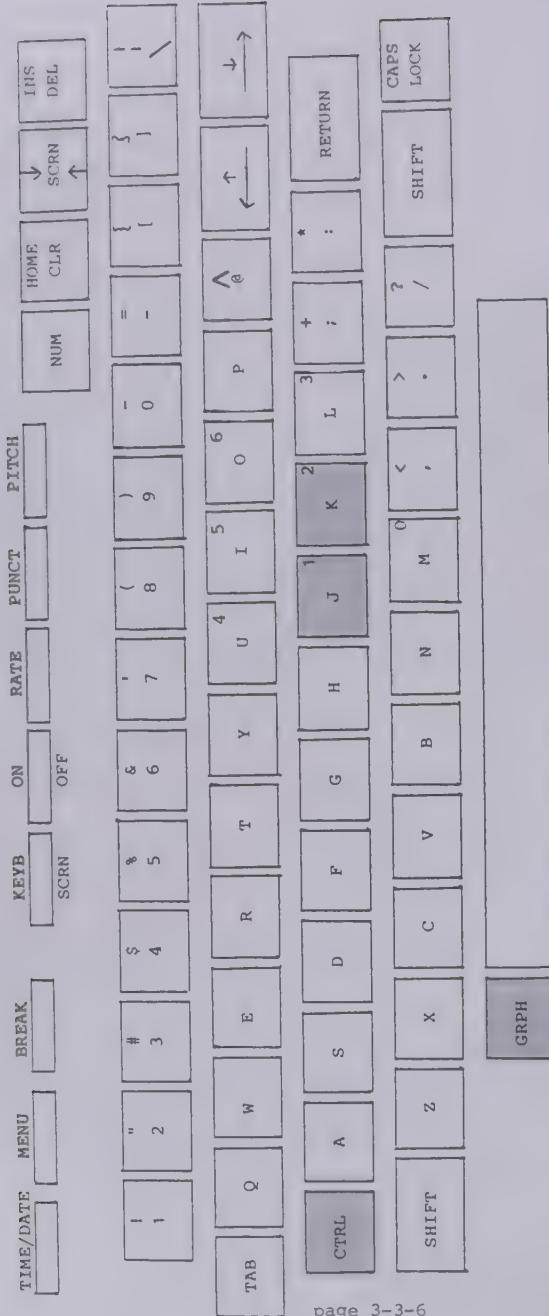
To move the cursor to the first character of the next word (Front Word),

Press and hold GRPH, Press and hold CTRL, Press U, Release all 3 keys

This command is called "Front Word." Use the front word command a second time and the cursor will move to the next word. If the next word is a number, such as the date "1985," SMALL TALK considers that group of numbers a word, because it is separated by blank spaces from other words. If you use Front Word again, you will hear a tone telling you that the cursor dropped down to the beginning of the next line to search for the next word in your text.

Similarly, using the COMMAND key with the CTRL-H (backspace) will move the cursor backwards. This command, called "Back Word," moves the cursor backwards through your text, stopping at the beginning of each word. As in Front Word, Word Talk speaks each character upon which it lands at the beginning of each word. (See Figure 3-3-4)

If you want to travel down your text, line by line, simply use the RETURN key continually. The text is not affected as you hit RETURN over and over. The cursor goes to the first position on the line below the current position. If there is information on the line, the information will be read aloud.

To move the cursor to the first letter of the previous word (Back Word),

Press and hold GRPH, Press and hold CTRL, Press H, Release all 3 keys

To move down lines in your text,

Press RETURN

Section 3-5: Inserting, Deleting, and Erasing

Return to the beginning of your file by using the COMMAND CTRL-K sequence. Press RETURN to move down to the next line. The next line, directly under the date, is the letter's salutation. The letter would be more appropriate if there were a blank line between the date and the salutation. You insert a blank line by typing CTRL-N (Insert). Word Talk will speak the word "insert" to confirm your command. Then you'll see that everything below the date (the salutation and the text) has been moved down a line. Then go to the next line, the salutation, and use the Insert again go insert another blank line between the salutation and the first line of the letter. (See Figure 3-3-5)

To insert a blank line,

Press and hold CTRL, Press N, Release both keys

FRONT WORD AND BACK WORD COMMANDS

Figure 3-3-4
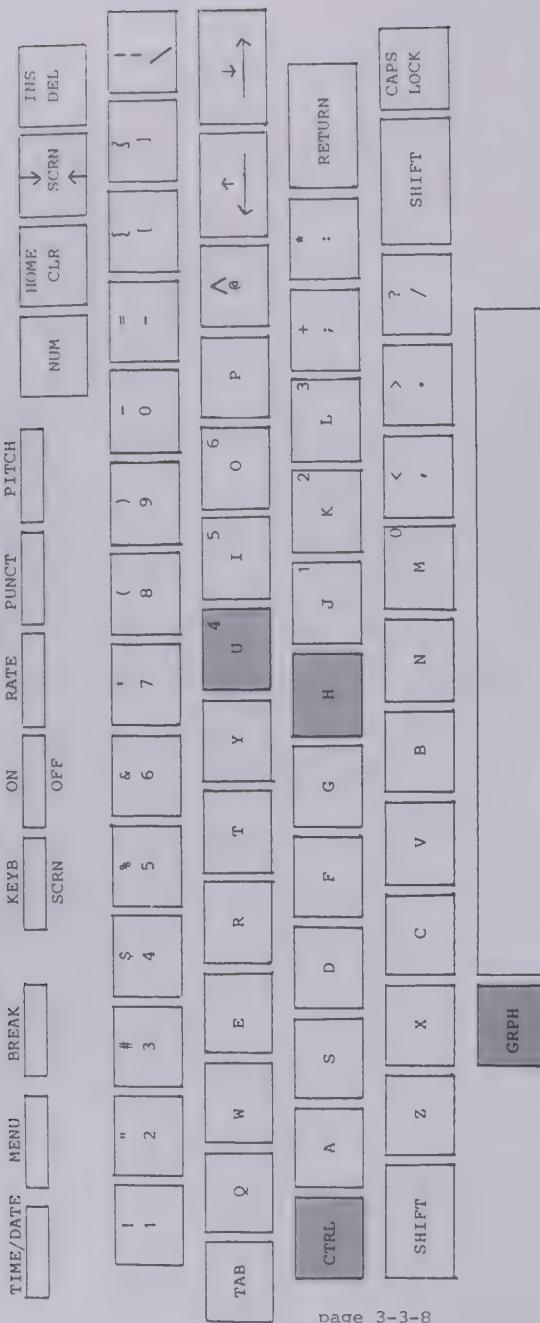
INSERTING, DELETING, AND DUMPING LINES

Figure 3-3-5

Delete a Line: CTRL-D   Bump a Space: CTRL-B   Insert a Line: CTRL-N

Deleting is an equally simple process. If you want to delete a line, whether
it is blank or contains text, simply type CTRL-D (delete). Word Talk will
speak the word "delete" to verify your command. Word Talk will also speak the
character of the new line above the cursor.

To delete a line,

Press and hold CTRL, press D, release both keys

You can also insert and delete parts of lines. If you move the cursor to the
beginning of the text, use the CTRL-U front, space command to move to the
first word. The first word is "Dear" as in "Dear Boss." Word Talk will speak
"D" (in a slightly higher pitch because it is a capital letter), then "e", "a",
and "r" as long as you continue to press CTRL-U. Stop at the first space--af-
ter the "r". This space separates two words--"dear" and "boss." Suppose we want
to add the characters "est" to "dear?" We want "Dearest Boss."

If we simply typed these letters at this point, the letters would type over a
portion of the text, in this case, the name. Therefore, we have to "bump" let-
ters over to make space for our insertion. This introduces the CTRL-B "bump
command." Pressing and holding CTRL and pressing "B" once bumps the entire line
one space to the right. Each time you press "B" while holding CTRL, the portion
of the line to the right of the cursor is bumped one space, or column to the
right. You create room to insert additional words and letters.

To bump a line or portion of a line to the right,

Press and hold CTRL, press B

Type CTRL-B three times; that creates three blank spaces in which to write.
Then type the "est" to the end of "dear" and you have elevated the status of
Mr. Boss from simply a dear to a dearest. Use CTRL-L to hear the new opening.

If, however, on second thought, you decide your boss is anything but your
"dearest" boss, and you want to reinstate the former status, use the DELETE
key. The DELETE key is located at the far right end of the line above the
Home Row. It is above and to the right of the RETURN key and has two arrows
on it--one pointing down and the other pointing to the right. Pressing the
Delete key deletes the character the cursor is on at the time and moves any
text to the right of the cursor to the left, one space at at time . . . one
space every time you hit the DELETE key. The specific character that is de-
leted is spoken by Word Talk as it is deleted. (See Figure 3-3-6)

To delete a character under the cursor, and to move the right
side of the line to the left,

Press DELETE

Delete Key
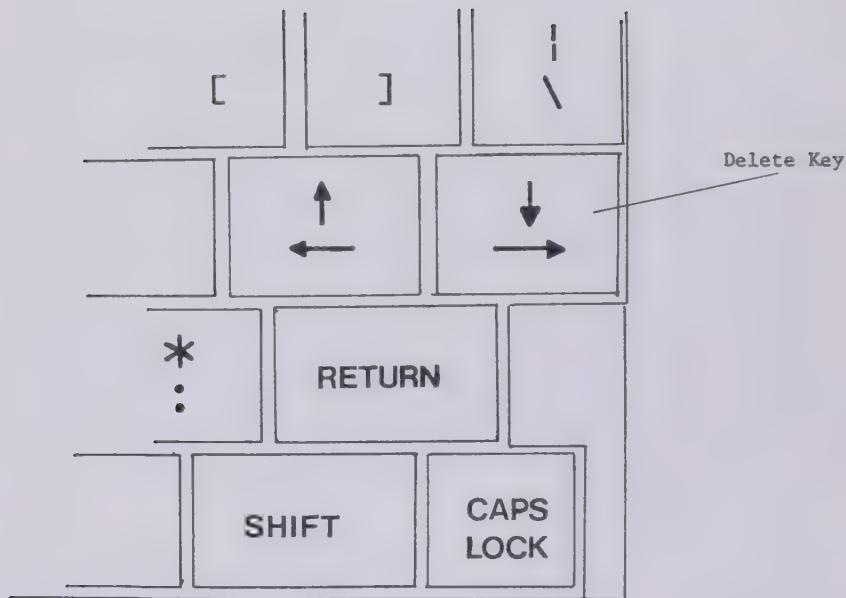
If you want to delete an entire word, use the COMMAND key in conjunction with the DELETE key. In this combination, all characters from the one above the cursor to (but not including) the first character of the following word are deleted. When you activate this command, the entire word is deleted automatically and the first letter of the following word, which the cursor is now beneath, is voiced by SMALL TALK.

To erase an entire word,

Press and hold GRPH, press DELETE

If you want to erase a line of text beginning from the cursor position, use the CTRL-E (E for erase) command. When you activate this command, the character above the cursor as well as all characters to the right of the cursor on that line are erased.

To erase a line of text to the right and including the cursor position

Press and hold CTRL, press E, release both keys

If you want to erase an entire line, hit RETURN to get to the beginning of the next line and activate CTRL-E. This will erase the entire line.

Press RETURN, press and hold CTRL, press E, release both keys

The commands we've just discussed are known as "line oriented" commands because they do not affect the organization or movement of any lines except the line you happen to be on as you execute the commands. (See Figure 3-3-7)

Remember that when you bump letters to open up a line to additional characters there must be room on the line to take up any extra characters. When the last character on the line reaches the right margin, no further bumping can be done. Characters will not bump to the following line. There is a way to insert text that gives you more freedom—"cutting." Remember also that the deletion command is also a line-oriented operation. Characters will not be pulled up from the following line. Continued deleting will shorten the line. Pulling text together from other lines is a function called "pasting."

Section 3-6: Cutting and Pasting

Cutting and pasting means cutting, changing, moving, and then putting all these operations together again in whatever new order you've arranged. We can demonstrate cutting and pasting by creating and inserting a sentence between two existing sentences.

EPASING LINES AND WORDS

Figure 3-3-7
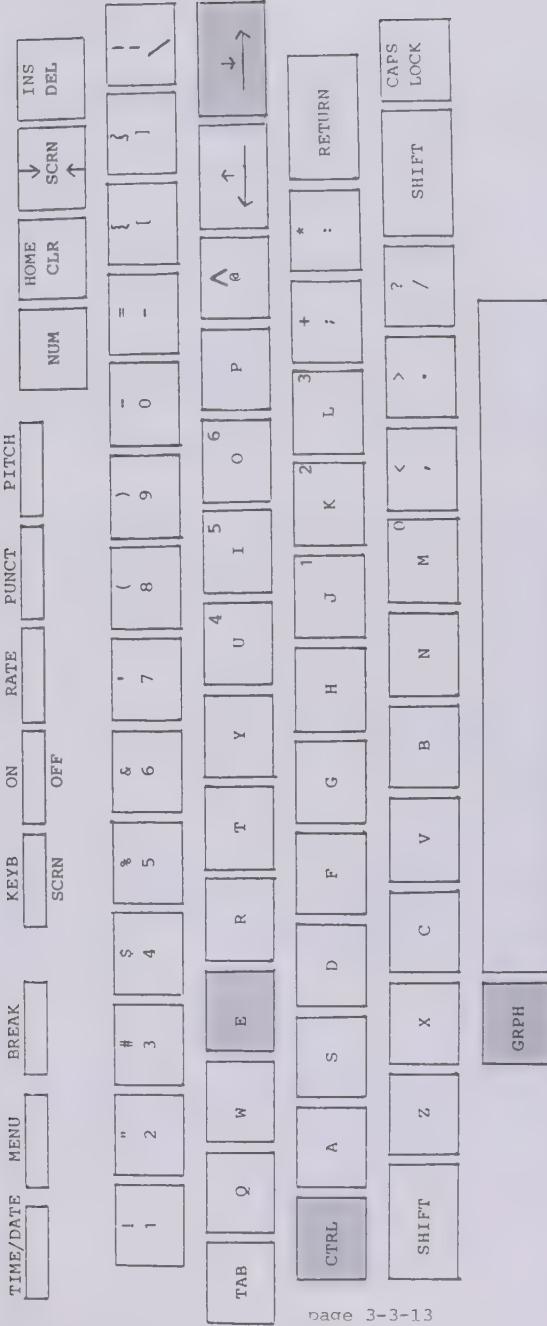
GRPH/CTRL-E . . . Erases an Entire Line
GRPH/Delete . . . Erases an Entire Word

Move the cursor into position beneath the first character of the last sentence you've written. If we want to add another sentence before this one, we literally cut the text apart and type in the new sentence. Cutting the text apart at this point means typing a new command--CTRL-C (the "C" stands for cut). The letter under which the cursor was positioned and the entire line to the right of that letter move to the next line. You have actually inserted a new line and dropped the previous line with the text down to it, leaving the line or portion of the previous line blank so you may insert what you like.

If the sentence you are adding is too long to fit on the one line you created, it will continue on the next line, pushing the existing text along with it. The new sentence wrapped around to the following line or lines, the rest of the text was pushed down, and new blank lines were inserted to hold what was added, or wrapped, from above. The word-wrap operation always inserts a new line to wrap to. Therefore, after creating one blank line, you need do nothing else-- SMALL TALK automatically creates new lines as needed. Type as much as you need to.

To join the new insertion with existing text, use the Paste command--CTRL-P. The "P" stands for . . . you guessed it . . . "Paste." You don't have to paste if you don't want to. Although Cut and Paste are often used in conjunction with each other, they can function independently. Immediately after typing the period and the two spaces that end the new inserted sentence, use CTRL-P to paste (join) the paragraph together. (See Figure 3-3-8)

CTRL-P can be used any time you want to pull together elements of a paragraph-- after an erasure, a word deletion, or almost any editing job. When you paste, Word Talk searches for gaps beginning at the cursor location and continuing to the end of the paragraph. If a gap is found, words are pulled together, even pulling up from the next line, until a new paragraph has been designed to conform to the configured margins.

A paragraph, according to SMALL TALK's Editor, is a passage of text that either begins with an indentation or is separated by a blank line from the previous paragraph or group of text. Therefore, you may skip lines between paragraphs or double space and indent each new paragraph. The Editor's pasting does not disturb text beyond the affected paragraph, unless it needs to pull up a line or lines from the paragraph below to fill a line left empty from pasting.

Section 3-7: Built-in Reference Card

SMALL TALK provides a complete list of the Editor's commands. By using another command--CTRL-O ("O" standing for options), you have a ready reference to all Word-Talk's commands. Activating CTRL-O immediately lists on the screen and speaks aloud all the Editor's options. When the listing has been completed, you return automatically to the text location from which you just left. (See Figure 3-3-9)

CUTTING AND PASTING COMMANDS

Figure 3-3-8
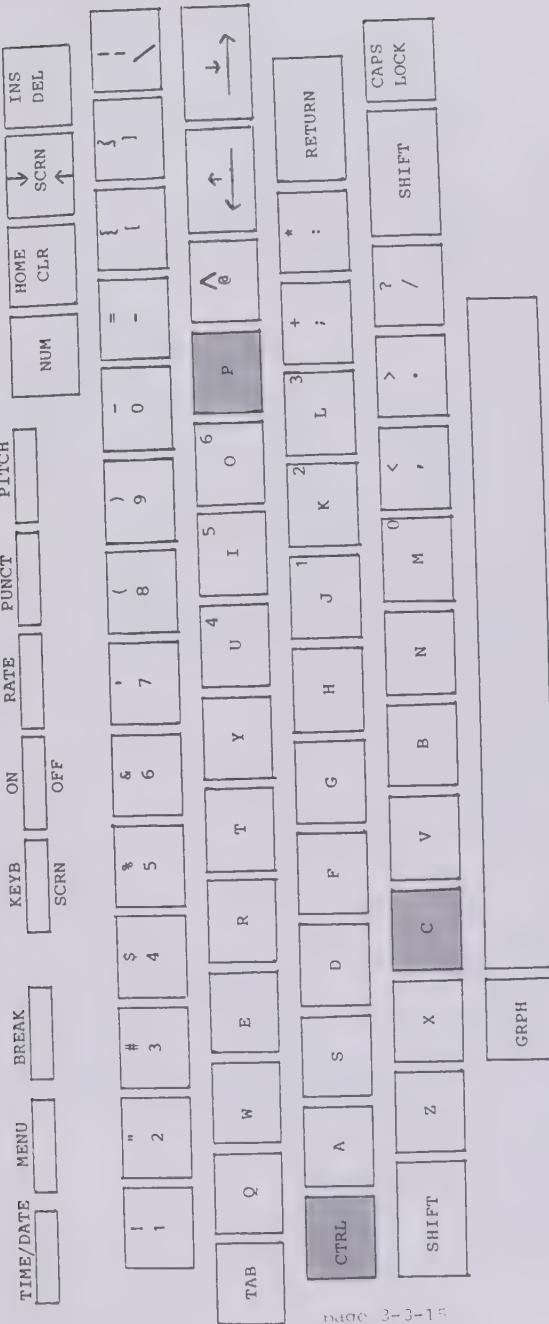
CTRL-C . . . Cutting Command
CTRL-P . . . Pasting Command

ALL EDITOR OPTIONS AND COMMANDS

Figure 3-3-9

TIME/DATE   MENU   BREAK   KEYB   ON   RATE   PUNCT   PITCH

NUM   HOME CLR   SCRN   THS DEL

KEYB: SCRN   ON: OFF

CTRL-O . . . To Review All Editor Commands
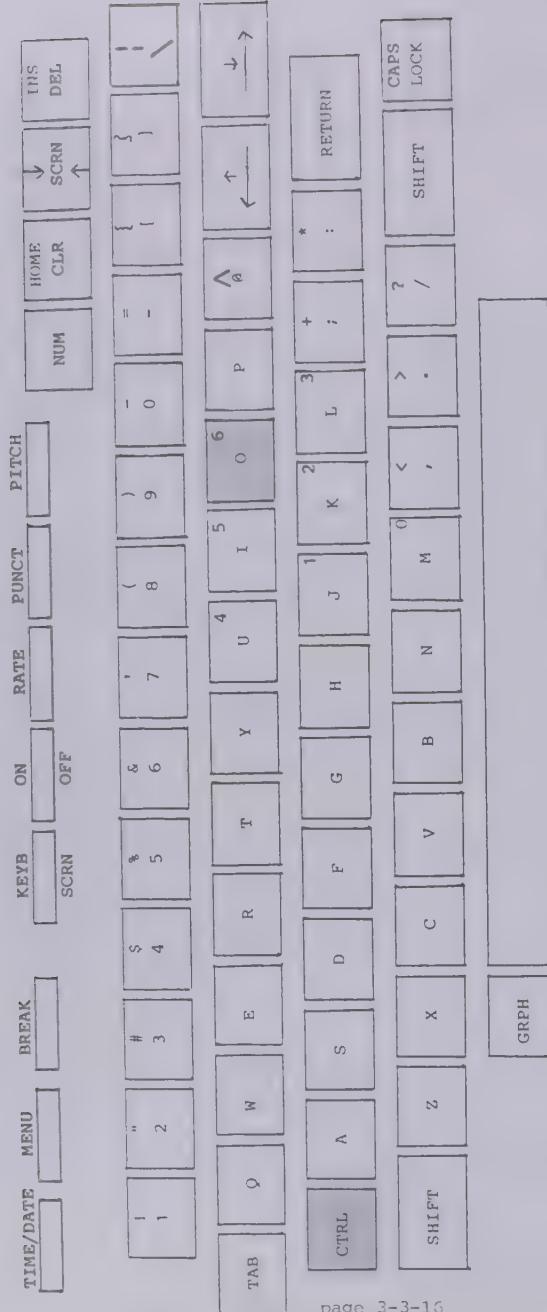
Section 4: Editor Extras

Section 4-1: GOTO Scrolling

You can go to any point in the document you are preparing by simply typing a new command--CTRL-G. When you type CTRL-G, Word Talk prompts you by writing on the screen and asking "WHERE?" If you want to go to page 3 of your text, type "P3" and press RETURN. The first line of page 3 will be displayed and the cursor will be placed in the first column of that line. (See Figure 3-4-1)

To go to page 3 of a document,

Press and hold CTRL, press G, release both keys, press P, press 3, press RETURN

If you want to reach line 35 of your text, then type CTRL-G, press L35 when you are prompted with "WHERE," and press RETURN. The cursor will go to the first column of that line.

To go to line 35 of a document,

Press and hold CTRL, press G, release both keys, press L, press 35, press RETURN

If you want to reach a specific column on a page, follow the same procedure. type CTRL-G, and after the "WHERE?" prompt, press "C" and a number to reach a specific column on a line.

To go to column 20 on a line,

Press and hold CTRL, press G, release both keys, press C, press 20, press RETURN

As you familiarize yourself with these commands, you will find it simple and second nature to reach any portion of your document.

Section 4-2: Additional Remarks on Tabbing and Backtabbing

We have already discussed that you can tabulate to reach certain positions on a line. The default positions at which the tab is set are, from the first column, set to tab 4 spaces, and then 5 spaces at a time. You can also tab backwards. Tab a few times to move the cursor out to the middle of a line. Press the COMMAND key and while holding it down, press TAB. You are backtabbing to the left margin. Establishing specific tabs is accomplished through the "Tab Menu," to be discussed in Section 8. (See Figure 3-4-2)

SMALL TALK KEYBOARD

GOTO Scrolling

Figure 3-4-1

Press Tab Key
to Backtab

Press Command Key First and Hold
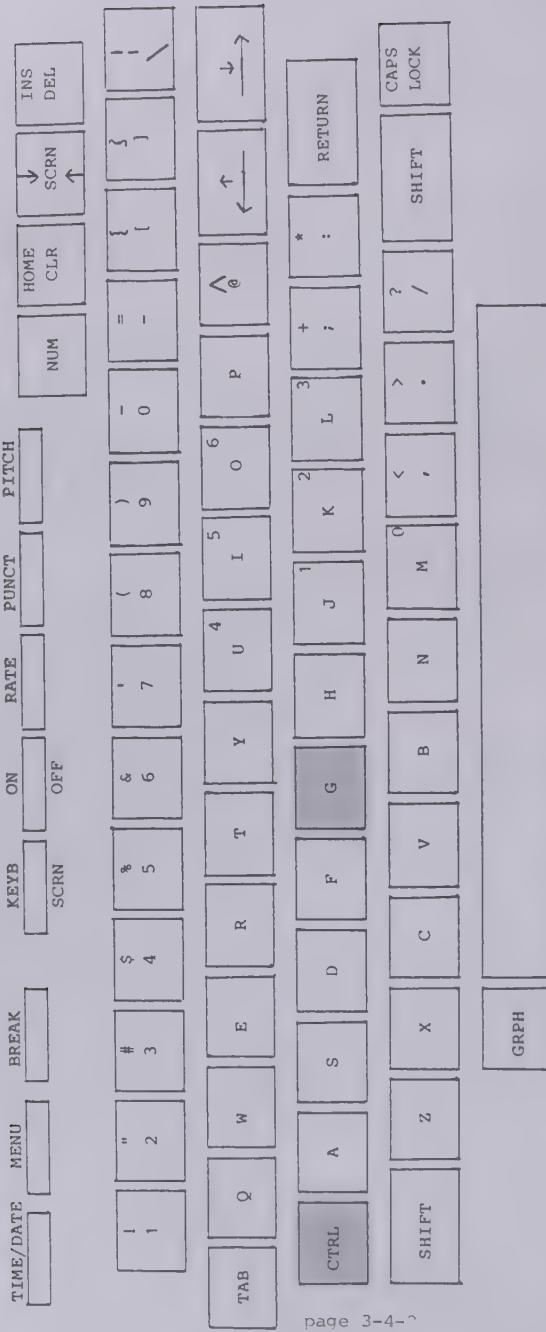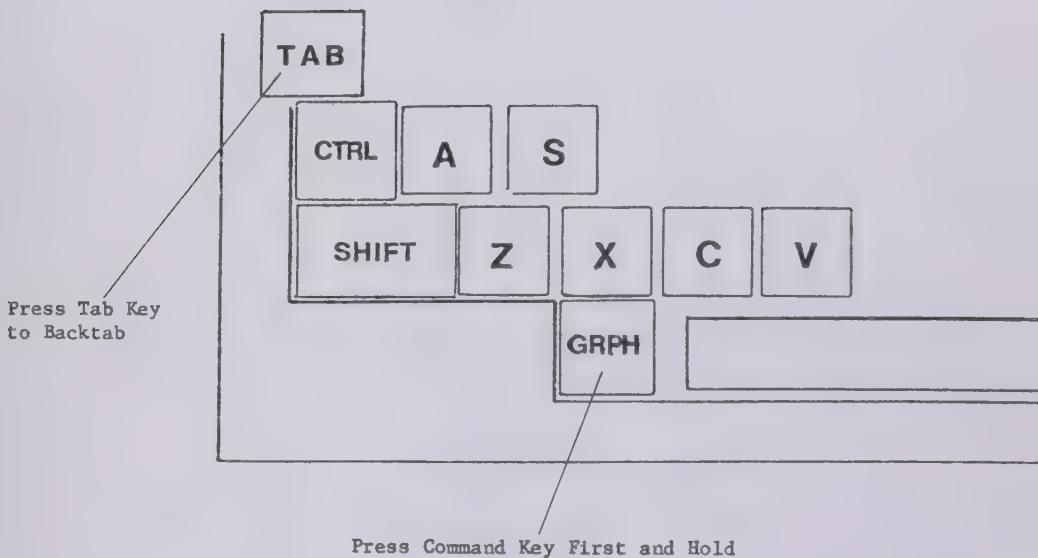
..n additional special tab command is CTRL-T, or Express Tab. This command moves the cursor all the way to the right margin. There are times when you will want to reach something near the end of a line; backtabbing, or back-spacing from the right margin may be quicker. And, Express Tab has a re-verse function—Express Backtab. By typing CTRL-Y, you can move directly to the left margin of your line. (See Figure 3-4-3)

To backtab,

Press and hold Command key GRPH, press TAB

To tab to the end, or right margin of a line with Express Tab,

Press and hold CTRL, press T

To tab to the left margin of a line with Express Backtab,

Press and hold CTRL, press Y

Section 4-3: Line Centering

CTRL-W is the command that will center the line on which the cursor currently lies. CTRL-W divides the empty spaces on the line and centers the line, re-gardless of where the cursor is on the line when you activate this command. The amount of space available on the line is determined by the way you have set the right and left margins.

Section 4-4: Find and Replace

Word Talk has a very important feature, a search feature, which we call "Find and Replace." If you want to change any word in a text, Word Talk can search and automatically change it. For example, in the letter you wrote to your boss asking for a raise, you might decide that instead of calling him Mr. Boss, you will accomplish more if you call him Mr. Wonderful.

The Find and Replace feature works with the Edit menu. Call up the Main menu and from that menu call up the Edit menu. The Edit menu will be displayed as below:

```
                - EDIT -
         F=FIND,    R=REPLACE,
         B=BLOCK
```

Select the "F" for FIND. When you select this option, Word Talk will ask you for the target of your search. In this case, it is "Boss." Type in Boss and press RETURN. Don't worry about lower case or capital letters; Word Talk does not consider them.

EXPRESS TAB

Figure 3-4-3
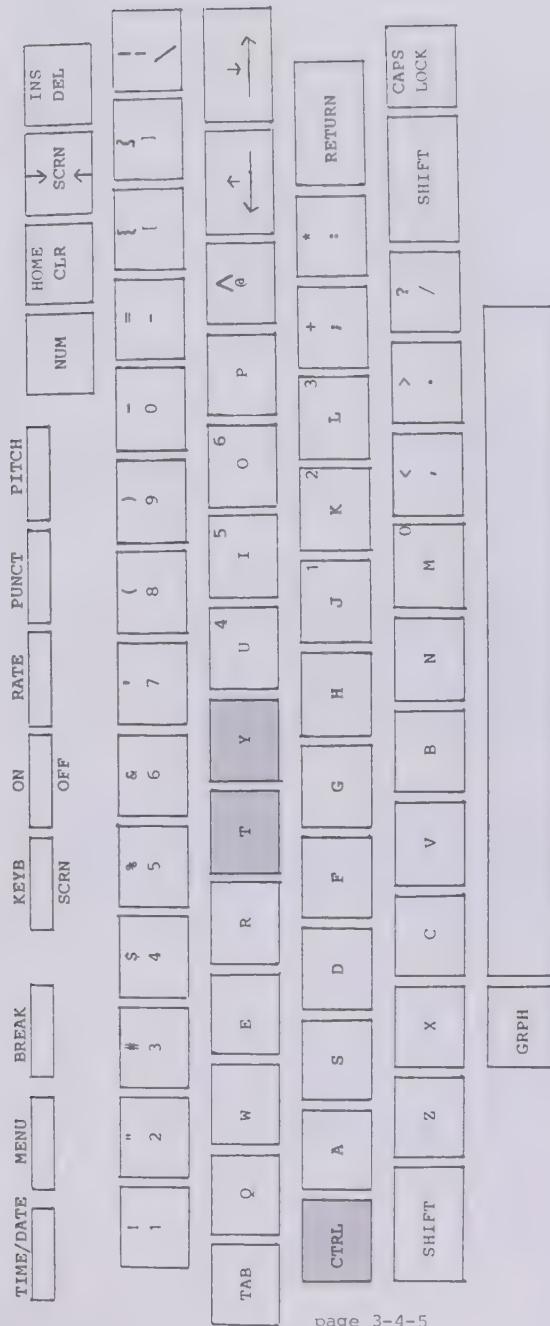
NOTE: This might be a consideration at another time, realizing that Word Talk
      doesn't differentiate between lower and upper case letters. If you
      have some words written in all capitals and want to only search them,
      you will have to remember the way Word Talk searches.

Word Talk will ask you with a second prompt if Boss is a "substring." A sub-
string is a series of characters that is found directly attached to characters
surrounding it. For example, the "Bo" of Boss is a substring; the "oss" of
Boss is a substring, the SMA of SMALL TALK is a substring. Boss is not a
substring. It is better to search for a complete word, or as many letters of
a word as possible to avoid getting "hits" on parts of words.

If, for example, we were searching for the word "small" as in SMALL TALK, we
would want to search and find only the word small, and not some substring or
part of it. If we only specified part of the word, searched for a substring
of "small," we'd eventually find "small" but we'd also find words and charac-
ters we don't want, like "all," "mall," or "ma." Therefore, specifying as
much of the target as possible, making the target as unique as possible,
saves time during searching.

After replying to the question prompt as to whether this is a substring by
pressing "N" for "no," we again get the Edit menu. This time press "R" for
"Replace." Type in "Wonderful." This tells Word Talk that every time it
searches and finds the word "boss," it should substitute "Wonderful." At
this point, what you type in is very important, because Word Talk will enter
exactly what you type--capitals and all. So type very carefully, capitaliz-
ing the "W" in Wonderful if that is what you want. After you have typed your
entry, press RETURN.

After you have typed in Wonderful and pressed RETURN, Word Talk will prompt
you by asking if this replacement is global. If you want the "Find and Re-
place" program to search the entire text and replace every Boss occurrence
with Wonderful, then type "Y" for yes. The task will be accomplished immedi-
ately. To do a global search, the cursor must be at the top of the file; if
it is not, the program will only search down from the point at which the cur-
sor lies and miss any targets above.

However, doing a global find and replace can affect text. Perhaps you have
used the word "boss" in another context, such as, "Mr. Boss, you are a won-
derful boss." If we do a global find and replace, we would end up with,
"Mr. Wonderful, you are a wonderful Wonderful." We don't want that. To
avoid these types of situations, go back to the Edit menu and select "F"
for Find. When the target is requested, type in "Boss." Then say "no" to
the question as to whether this is a substring. Next, select "R" for Replace.

Enter "Wonderful" as the replacement but this time answer "no" by pressing "N" when you are prompted with Global? This means that you will do the re-placing yourself.

Now enter the Editor and do each replacement at a time. Use the command key-CTRL-K combination to get to the HOME position. After all, we want to begin at the top. To find the first occurrence of the target, type CTRL-F, for FIND. The cursor will go to the first character of the first occurrence of the target, stop, and voice the character. You may want to use the Review Command to hear the line. Press CTRL-L. Make your correction by typing CTRL-R; "Boss will be taken out and "Wonderful" will be substituted. Press CTRL-F and you will immediately arrive at the next occurrence of the target. (See Figure 3-4-4)

While using CTRL-R, the cursor may move off the line that contains the tar-get, and when you activate the CTRL-R command, you will hear an error tone. Because you have moved off the target, the Find and Replace program doesn't understand that you are replacing a target so it doesn't know what to re-place. Simply move the cursor back to the first character of the target.

Another very convenient feature of Find and Replace that can save you time and, perhaps, some boredom, is when you are using the same word over and over again in a long text. For example, if you are preparing a lengthy report and the phrase "SMALL TALK's voice output" is used incessantly. You may substi-tute another target, type in another target, such as && instead of typing out the longer phrase again and again. When the document is completed, activate the Find and Replace program, enter && as your target, enter "SMALL TALK's voice output" as the replacement, answer "Y" to the global prompt, and you will have replaced every occurrence of && with "SMALL TALK's voice output."

The Find and Replace program uses all the numbers, letters, and punctuation marks on SMALL TALK's keyboard as parts of the target and replacement. Each entry may be as long as 60 characters each and you may use spaces at any point or points within the replacement--beginning, middle, or end.

FIND AND REPLACE COMMANDS

Figure 3-4-4
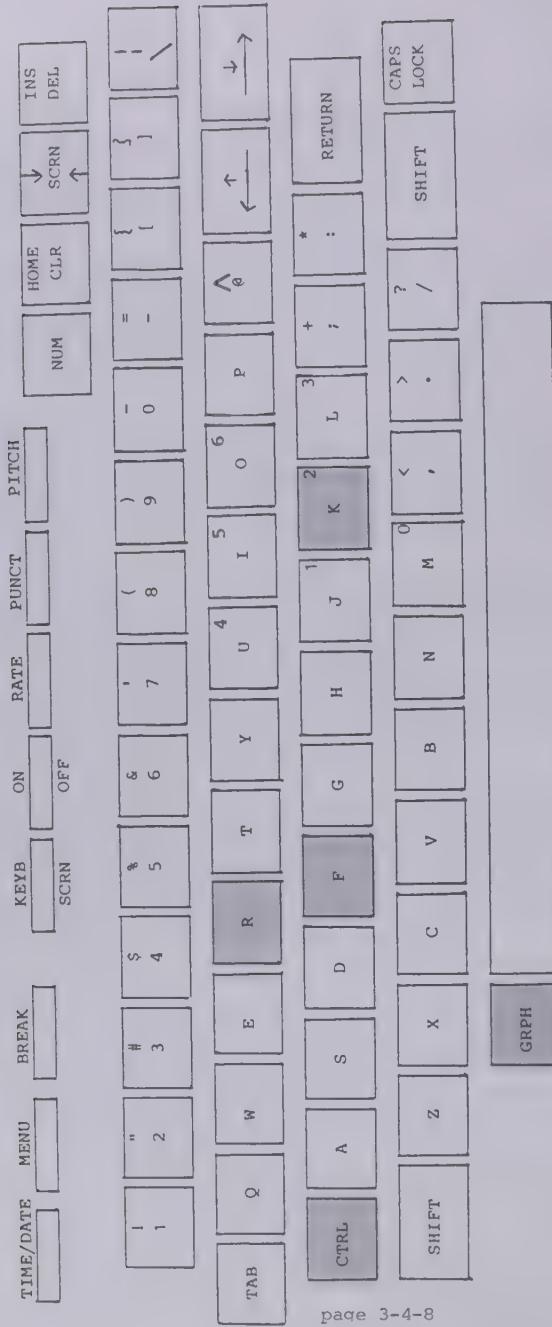
Section 5: Block Operations

Section 5-1: Introduction and Marking the Block

Block operations are those that move, copy, and/or delete large portions of text. Moving a paragraph to a new location is a block operation. Any series of characters, even as long as 2000 characters, is considered a block of text. A single word is also a block of text. To activate block operations, you have a Block menu which is reached via the Main menu and then the Edit menu. From the Main menu select E for the Edit menu. From the Edit menu, select B to reach the Block menu.

The Block menu appears on the screen this way:

- BLOCK -
M=MARK,   C=COPY
D=DELETE, W=WRITE

Before beginning a Block operation, you must determine the beginning of it. Define the block by telling Word Talk the beginning and end of the block. Enter the text through the Editor by pressing RETURN from the Main menu and move the cursor to the first character of the block you want to manipulate. Then use the ESCAPE key to exit the Editor, and go to the Block menu. Select M (for Mark) from the Block menu.

If you want to delete a paragraph, mark the beginning as discussed above. Return to the Editor, move the cursor to the end of the paragraph you want to delete, press the ESCAPE key to return to the Block menu, and press "D" for Delete. The marked block, the paragraph, will immediately disappear. The text will then be pasted together as if the paragraph had never been there.

The M=MARK option only concerns the beginning of a block. After moving the cursor to the end of the desired block, the D=DELETE selection detected the cursor's position at the end of the block and deleted the completely defined block.

To Select and Delete a Block of text,

Move cursor to beginning of passage to be deleted, Select M=MARK from Block menu, move cursor to end of passage to be deleted, select D=DELETE from Block menu

Section 5-2: Deleting

After you remove a block of text as we demonstrated in the previous section, that text is still available to you. A special area of SMALL TALK's memory retains it. This reserved memory is called the "Block Buffer." You can put this saved text somewhere else if you want. The buffer continues to save

deleted text until a new block operation saves something else in it. De-
leting a block is the first step in moving text.

Section 5-3: Copying

Copying a block of text is similar to deleting except that when you select
C=COPY, the characters are not removed from the document. The passage is
left unchanged. The passage is just copied and left in the block buffer so
that you can write it back to the text later.

Section 5-4: Writing

Writing demonstrates the real strength of block operations. A block of text
that has been deleted or copied from your text can be written back to the
text at another location. Simply move your cursor to the position that you
want the characters in the block buffer to begin and select W=WRITE from the
Block menu. The entire contents of the buffer will then be inserted into
your existing text at the cursor's current location.

You may write the buffer's contents into the text as many times as you like.
This is a very convenient feature because there may be occasions when you
want to insert a repeated word, phrase, or paragraph into your text and you
will not want to type it repeatedly.

Section 5-5: Moving Text

Moving text is a two-step procedure. The first step is to delete the block
of text that you want to move. That block, whether one character or 2000
characters, is now stored in the buffer. To complete the movement of the
block, re-position the cursor at the point you want the passage moved. Then
write the contents to that location using the W=WRITE selection.

Section 6: FORMAT OPERATIONS

Section 6-1: Formatting Overview

Word Talk is able to prepare documents of almost any size or shape. If, however, you desire a document the actual size of say, Nebraska and bordering counties of Iowa, Word Talk can't help. However, formatting allows you to establish margins, spacing, length, and width of all the pages of your document. Word Talk permits a maximum of 80 characters per line and pages up to 255 lines long. You can set virtually any number of tabs to permit formatting for columnar work.

The first consideration of formatting is the size of the paper you are using. For example, the standard 8 1/2" x 11" paper will accommodate a certain number of lines depending on the size of the type you are using. The number of lines depends on what is called the "throw." Throw is usually 6 lines per inch for Pica type and 8 lines per inch for Elite type. If we were using Pica type, 66 lines would be able to be printed on the paper--6 (lines per inch) multiplied 11 (length of paper). Thus, the length of the paper is said to be 66. If we consider elite, the length would be 88--8 (lines per inch) multiplied by 11 (length of paper).

Pitch refers to the number of characters that can be printed in one inch across the page. Pica type is 10 pitch, meaning that 10 pica characters can be entered into one inch of space. Elite type is 12 pitch, meaning that 12 characters can fit in one horizontal inch of paper. Taking Pica type as an example, if we multiply 8 1/2 (width of paper) by 10 (Pica characters per inch) we arrive at the figure of 85. We say that there are 85 characters per line.

However, you don't want print from top to bottom, left to right covering the entire sheet of paper. You must be concerned with margins. If we set one inch margins on all four sides of the paper, then we say the top margin is 6 lines (number of Pica lines in an inch); the bottom margin is 6 lines for the same reason. Because the page can accommodate a maximum of 66 lines, we subtract the top and bottom margins from the total length--66 lines minus 12 lines gives us 54 lines upon which to type. The 6 lines reserved for the top margin means that we start typing on line 7. Additionally, because we want six lines between the last typed line and the page bottom, the last line to accommodate type will be line 60.

The width is determined similarly. Using Pica type, we have 85 characters possible across the page. Subtracting the two inches for the one inch right and one inch left margins leaves 65 spaces for typed text: 85 minus 20 (ten spaces for each margin). If we begin the left margin at column 11 (10 spaces in), add the 65 spaces available, we immediately understand that our right margin must be set at 76 (11 + 65). Typing begins at column 11; it ends at 76.

All of these elements are grouped under the Format Menu. To get to the For-
mat Menu, select F=FORMAT from the Main Menu. The Format Menu looks like
this:

```
              - FORMAT -
          L=LENGTH, S=SPACING,
          T=TABS,   M=MARGINS
```

Section 6-2: Setting Up the Format

To format the length of your paper, consider the physical size of the paper
and whether you will be in Pica or Elite type. Set the length by selecting
L=LENGTH from the Format Menu. You will be prompted by Word Talk for the
number of lines you want. Just type in the new number over the 24 (the
default number) and press RETURN.

Do you want to single or double space the paper? Call up the Spacing menu
from the Format menu by selecting S=SPACING. The Spacing menu will appear
on the screen as shown below. Of course, Word Talk will read exactly what
appears on the screen.

```
            - SPACING -
          S=SINGLE, D=DOUBLE
```

Simply type in the letter that corresponds to your choice. Word Talk's de-
fault is for single spacing.

Set the margins by calling up the Margin menu. From the Format menu, select
M=MARGINS. The Margins menu appears on the screen and is spoken:

```
             - MARGINS -
          L=LEFT,    R=RIGHT,
          T=TOP,     B=BOTTOM
```

Listed in the Margins menu are all the margin options. Go through and set the
particular margin characteristics you want. The text resides between margin
pairs. That is, setting a left margin at 10 means that typing will begin at
column 11. A right margin set at 76 means that typing will end in column 75.
Similarly, top and bottom margins are set the same way. Setting a top mar-
gin at 6 means that typing will begin on line 7. Setting a bottom margin at
line 60 means that typing will end on line 59.

Section 6-3: Changing the Format

The established format can be changed while you are in the middle of a docu-
ment. This is accomplished by selecting the same menu options discussed above.

You can change the right and left margins at any time, but when you do, you cause the entire document to be reformatted. The result is often that page breaks and word wraps occur in different places. Changing the top and bottom margins also means that the page boundries will be affected. Pages will not necessarily begin and end at the same places as before. Page breaks will be affected by length specification changes also.

Section 6-4: Tabs

Tabbing has, of course, no effect on your written text. Tabbing is a very convenient way to move across the page and stop at specific, pre-ordered points. Tabbing has its own menu. To reach the Tabs menu, select T=TABS from the Format menu. The Tabs menu appears on the screen as shown below and is spoken by Word Talk.

```
        - TABS -
I=INIT,   S=SET,
C=CLEAR
```

Tabs must be inititalized, set, and cleared from the Tabs menu. As mentioned earlier, there are default positions for tabs: if you tab without setting your own tabs from the menu, you will, beginning from the left margin, tab to column 4, then tab to every fifth column. If you want to clear all the tabs at the same time, use the I=INIT option. To clear an individual tab stop, move the cursor to the tab stop using the Editor. Move to the Tabs menu and select the C=CLEAR option. This will remove the tab stop at the cursor's location only.

To set a new tab, just select the S=SET option from the Tabs menu and a new tab stop will be established at the cursor's location. Then, when you are in your text, simply pressing the TAB key (located directly above the CTRL key and directly left of the "Q" key) on SMALL TALK's keyboard moves the cursor to the tab stop you set.

Section 6-5: Remembering Format

Word Talk remembers all the specific format commands in your individual documents. The memory saves the values for the length, spacing, margins, and all tabs you set as well as the text itself. Each time text is saved on tape, the format information is saved with it. When a file is loaded from the micro-casette, Word Talk can put the file back into memory in the original format by restoring the original format values.

SECTION 7: The MICRO-CASSETTE

Section 7-1: Introduction and Organizing Text on Tape

SMALL TALK's built-in micro-cassette is a convenient way to store text permanently. The standard 30-minute micro-cassette tape will save up to over thirty pages of double-spaced text on each side. The micro-cassette will, of course, save several smaller text files also.

In order to activate the tape operation, access the Tape Menu. You access the Tape menu by calling up the Main menu and selecting the T=TAPE option. The Tape menu is spoken by Word Talk and appears on the display screen:

```
            - TAPE -
      L=LOAD,    S=SAVE,
      F=FILES,   R=REWIND,
      C=COUNTER, E=EXTRAS
```

SMALL TALK's memory enables the word processor to create documents up to twelve double-spaced pages long. The micro-cassette holds thirty or so pages Therefore, we may store a maximum of two of the largest possible files on a single side of tape . . . two 12-page documents multiplied by two gives us 24 pages to fit on a tape able to hold 30 pages. You may want to hold five 6-page documents.

Documents saved are filed under whatever name you assign them. However, you cannot save documents on top of each other. If you save text at the beginning of the tape, and then save something else at the beginning of the tape, the first will be lost. Remember that when you save something on tape, you must consider where it is placed as well as its name.

SMALL TALK's micro-cassette has a tape counter that enables you to control where you are placing text. When you know where a tape begins, you can easily retrieve it as well as know where you can and cannot store additional programs.

Our suggestion is that you limit the number of files you save on each side of the tape to two. Also, place these files at specific locations. A 30-minute tape goes from 0 to 3000 or more, depending on the specific manufacturer. Dividing the tape in half, and designating the section at 1500 as the beginning of the second stored file, will get you into the habit of knowing exactly where your files are. Of course, you will have to remember changes if your files run longer than 15 pages or so. It will be easy to remember that your files always begin at Locations 0 and 1500.

In addition, you should get into the habit of backing up your files. You may back up a file that is itself at Location 0 on the tape on another location on that same tape, perhaps Location 1500, but if that tape is ever lost or destroyed, you lose both your original file and the back up. Your best protection is to back up all files on separate tapes.

Section 7-2: Setting the Tape Counter

When you call up the Tape menu from the Main menu, select C=COUNTER. You will immediately be prompted for a number by seeing and hearing COUNTER=0. Set the counter to any position from 0 to 3000 on a thirty minute tape. Simply type in the new value and press RETURN. If you are just looking and not entering a new number, simply press RETURN without changing the value shown.

NOTE: Always rewind a tape before using it, even before seeking and changing counter information. This will insure that the tape position and the designated counter numbers agree.

Section 7-3: Saving Files

To save a file that you have in memory, set the counter to the desired location. Select S=SAVE from the Tape menu. The display and voice will ask you for a file name. A file name can be any name up to 8 characters long, and may consist of letters and numbers. Letters may be upper or lower case; this makes no difference. However, you must always begin a file name with a letter.

To complete the entry and begin the operation, press RETURN after entering the file name. A file will be written to the tape using the name you have assigned it, complete with the additional information Word Talk will have saved concerning formatting characteristics that you set earlier.

Section 7-4: Loading Files

Loading files means making a copy of a specified file from the tape and putting this copy in Word Talk's memory area. For you to edit a file, it must, of course, be in memory.

Load a Word Talk file by selecting C=COUNTER from the Main menu and then position the tape in accordance with the counter. Select L=LOAD from the Tape menu. You'll be prompted for a file name. Enter the name, press RETURN and the operation begins. Word Talk will immediately search the tape for your file at the location you specified on the counter and move forward from that point. When the file is encountered, the Tape menu title is read. When a new file is loaded, any old text that is in memory is then cleared.

Section 7-5: Tape Contents

If you happen to forget what is stored on a particular tape, you have an option that allows you to review a tape's contents. From the Tape menu, select F=FILES. When you choose this option, Word Talk searches from the current tape position for file names. As files are found, their titles are displayed and spoken aloud. Remember to rewind the tape before executing the F=FILES command in order to hear the listing of files for the complete run of the tape.

Because a file search can take several minutes, you may want to abort the search with the BREAK key after you have found the file you want. The BREAK key is one of the System Function keys located above the keyboard's number row on the left side of the keyboard. The BREAK key is also useful to cancel, load, or save an operation.

Section 7-6: Merging Files

Word Talk enables you to merge text on tape with text in memory. Select from the Tape menu the E=EXTRAS option. This will give you another menu-the Extras menu which will appear on the screen and be read this way:

                    - EXTRAS -
                I=IMPORT, E=EXPORT,
                M=MERGE

The text in the tape file that you're merging can be placed anywhere you want it to be. Go into the Editor and position the cursor at the spot you want the insertion from the tape to start.

NOTE: You are moving text <u>from</u> the tape <u>to</u> the text in memory.

Position the tape counter at the appropriate location and select M=MERGE from the Extras menu. Word Talk will prompt you for the file name. Type in the file name, press RETURN, and the operation will be performed. At the end of the operation, the Extras menu will be read back again. If you press RETURN to enter the Editor, the cursor will now be on the <u>first</u> character that <u>came in from the tape</u>.

Section 7-7: Importing and Exporting

Importing and exporting files is similar to loading and saving. The difference is in the files themselves. Import and Export options enable you to work with files that do not have format information within them.

Importing allows the loading of any standard ASCII text file whether it was created by Word Talk or not. If you want to edit a BASIC program or read data created by BASIC, you would activate the Import option. More information on BASIC programming language and its applicability to SMALL TALK is contained in Part 4 of the manual.

Files put on tape through the export option are straight ASCII text. Again, the usual format information is omitted. This is very useful when you want to use the file with some program other than Word Talk. The Import and Export options' power comes when you are transferring files between SMALL TALK and another computer. This procedure is covered in Section 9 of the manual.

Section 7-8: Tape Maintenance

SMALL TALK's micro-cassette should be cleaned and demagnetized occasionally. Several cassette cartridges on the market are designed for cleaning micro-cassette heads.

Keep the tapes themselves in a safe place. If you have back-up tapes, keep them separate from the other tapes. Do not expose tapes to magnetic fields such as those produced by television sets. Micro-cassette tapes are usually leaderless, so when they are out of the unit, they should be kept in their cases to protect the tape surfaces.

SECTION 8: PRINT OPERATIONS

Section 8-1: SMALL TALK and External Printers

All printing operations begin with the Print menu. When you call up the
Print menu from the Main menu, the Print menu is displayed and spoken aloud:

                         - PRINT -
                    D=DEVICE, P=PARMS,
                    G=GO

SMALL TALK will interface with virtually any RS-232C computer printer. The
first thing to do, obviously, is connect SMALL TALK to the printer using a
printer cable available through a dealer. You must also insure that SMALL
TALK will talk to the peripheral printer--there must be compatibility.
Compatibility is achieved via SMALL TALK's Communications Function keys.

Located above the typewriter portion of the keyboard on the right side is a
row of four, gray special function keys. These are the Communications Func-
tion keys. They are located on a row just above but flush with the top row
of the keyboard, and they are located two inches below the micro-cassette
drive. These keys enable you to change SMALL TALK's RS-232C port settings if
you need to change them. The default settings are 4800 BAUD, no parity,
eight data bits, and one stop bit. The major meaning of this is that the
dealer from whom you purchased your printer should be able to match the
printer to SMALL TALK's defaults. (See Figure 3-8-1)

If you need to change SMALL TALK's RS-232C defaults, refer to Section 9 of
the manual. When SMALL TALK and the external printer are connected properly,
printing is easy. Be sure that SMALL TALK's printer is turned off. Locate
the RS-232C switch beneath the micro-printer. This switch is labeled PRINTER
OFF/ON and refers to activating the RS-232C interface. Turn it on by sliding
it to the right. (See Figure 3-8-2) Select the D=DEVICE option from the
Print menu. The Device menu will be displayed and spoken aloud:

                         - DEVICE -
                    M=MICRO, E=EXTERNAL,
                    V=VOICE

Whenever you print on an external printer, change the default from micro to
external. Select the E=EXTERNAL option. The RS-232C port will now be used
for all printing until you change the default back to micro; you change the
default back by selecting the M=MICRO option from the Device menu. Press the
ESCAPE key now to return to the Print menu.

Figure 3-8-1

Communication Function Keys
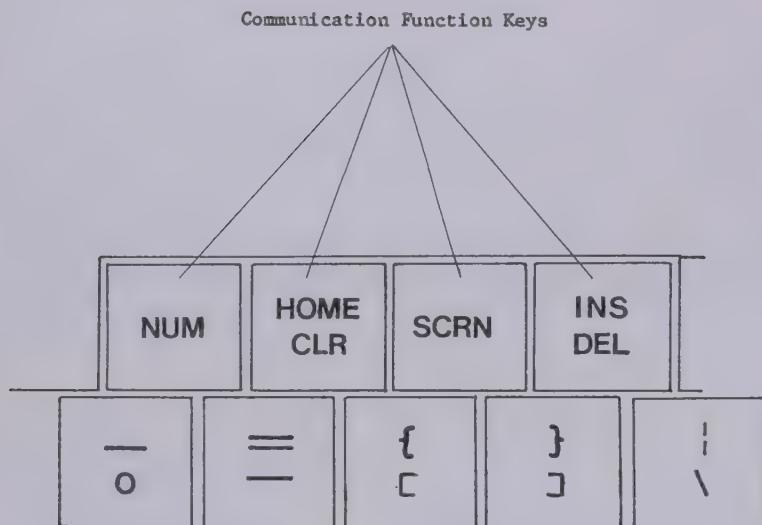
Figure 3-8-2
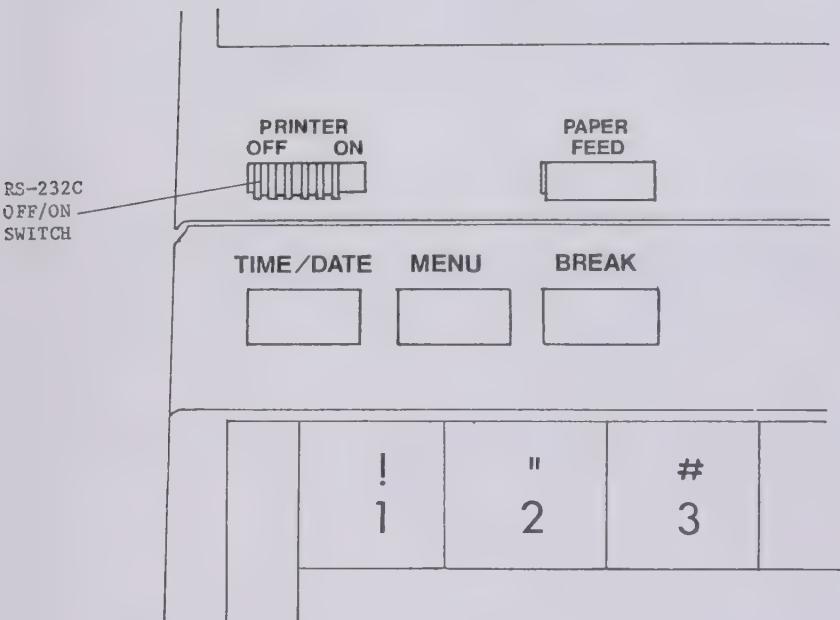
Turn on the printer and make sure that the paper is positioned correctly in it. Finally, select the G=GO option from the Print menu and you are printing. When an external print operation is completed, turn off the printer and turn off the RS-232C switch on SMALL TALK.

The RS-232C port should be kept off when not used because it can be a drain on the batteries. When it is turned on, the circuitry is energized; that is the reason to turn it on before you turn on the peripheral printer. Energizing the RS-232C circuitry often generates two or three spurious characters. Keeping the printer off until energizing the port avoids unwanted characters from being printed. Similarly, when the RS-232C port is switched off, other unwanted characters can be generated.

Section 8-2: Voice Print

Note that the Device menu has a V=VOICE option. There may be times when you want to hear your entire document read aloud from beginning to end without pause. This is called a "voice print." When V=VOICE is selected, the voice synthesizer becomes, actually, a default device. All print output is sent there until you change the assignment. You can use the CTRL-X command to stop and restart the reading, or voice print, as desired.

Section 8-3: Parms Menu

Parms is short for parameters. There are certain specifications that control printing that are available for you to establish as you need them. From the Print menu select P=PARMS. The Parms menu will look like this:

```
          - PARMS -
     S=SINGLE, T=TRACTOR,
     C=COPIES
```

There are three options from which to select when you have called up the Parms menu. The first two--single and tractor--refer to the type of paper and printing method you're using. If you are printing from individual sheets of paper that must be individually fed into the printer, then select S=SINGLE. Word Talk will stop between pages and allow you to change paper before it resumes. This is the default position. Word Talk will always stop after printing a single sheet. However, if you use tractor feed paper, then you might find it convenient to have all the pages printed at once. Word Talk will, if you select the T=TRACTOR option, feed each page up to the top of the printer before starting to print on it.

The second parameter to discuss is C=COPIES. If you want fifty copies of something you've printed, select the C=COPIES option. You will be prompted

as to how many copies you want. Simply type the number of copies you want. One copy is the default setting.

If you want to stop, or abort a print operation, simply press BREAK as you would to stop any operation in progress. The operation being performed is immediately stopped and the title of the Print menu is read.

SECTION 9: COMMUNICATIONS

Section 9-1: Uses

SMALL TALK will share information with any other RS-232C devices, not only printers. The machines must agree on communications protocol and you must consider the format of the information transferring.

What can you do with communications capability? You can transfer files you've created with Word Talk to other computers. You can also transfer files created on other systems to Word Talk. SMALL TALK can also be connected to reading machines and braille devices.

Section 9-2: Communication Function Keys (See Figure 3-8-1)

The first of the Communications Function keys (introduced in Section 8) is needed to set the BAUD rate. That is the key on the far left side of this group of four keys and it is the NUM key. In order to select a BAUD rate other then the one announced, you'll need the power of the COMMAND key. Pressing a Communications Function key won't change its setting. It only tells you the current setting. However, if you press the COMMAND key (GRPH) and hold it down while pressing the BAUD key a few times, you will hear the voice speak a series of number; these are the available BAUD rates. Word Talk rotors through all the possible BAUD numbers and voices them: "300,. 1200, 2400, and 4800." The default number is 4800. You can select any of these rates depending on your needs. You must use the Command key to actually change BAUD rates. The reason for this is to insure that values are not changed accidentally while you are handling SMALL TALK. Releasing the BAUD key and the GRPH key after having heard the number you want sets the BAUD rate.

The PARITY key is the key just to the right of the BAUD key. It is labeled "HOME/CLR." It has three settings--even, odd, or none, and the default setting is none, meaning no parity is used.

The DATA key is right of the PARITY key and it sets "word length." It can be set at seven data bits or eight data bits per word. The default setting for the DATA key is eight data bits. Press the DATA key, labeled SCRN, and you will hear either "seven" or "eight." Press the DATA key while holding the Command key, and the other number will sound. Set the word length information exactly as you have set the PARITY and BAUD rates.

The far right Communications Function key is the STOP key. This key is labelled INS/DEL and refers to the number of stop bits to be used. The possibilities are either one or two and the default setting is one stop bit.

Set the Communications Function keys to satisfy whatever your needs are. SMALL TALK will remember the values until they are changed. Once you have established the protocol between two machines, simply be certain that the proper cable is connecting them.

Additional information on interfacing is available in the Epson manuals that came with your SMALL TALK.

Section 9-3: Word Talk to Word Talk

Running the Word Talk program on another computer is the simplest way to transfer files. Transferring files is a common and important activity between Word Talk programs on other computers and the SMALL TALK's built-in Word Talk program.

Perhaps you have an IBM PC/AT at the office and you're using it to keep track of certain customer files. However, you will be traveling and away from the office for a week, and you want those files with you. What you will do is "download" those files to SMALL TALK. First be certain that you have established a correct interface. Bring Word Talk up on SMALL TALK and on the PC. You will use the Load option on Word Talk to receive the file from the PC. On the PC use the Save option on the Disk menu of Word Talk PC. Like loading and saving files, these options can be used to load files from other devices and to save files on other devices.

Using the proper disk option on the PC to get a client file in memory, turn on the RS-232C switch on SMALL TALK, go to the Tape menu and select L=LOAD. When prompted for a file name, type COM1 and press RETURN. COM1 is a special name for the RS-232C port. SMALL TALK will now wait for text to come in from that port. Go back to the PC and use the SAVE option on the Disk menu. Here use the name COM1 as the file name. When you press RETURN on the PC, the file transfer begins.

When the file is completely down-loaded to SMALL TALK, you'll hear the title of the Tape menu read signaling the completion of the transfer. Turn off the RS-232C interface.

This procedure can be reversed in order to transfer files from SMALL TALK to a PC. Energize the RS-232C port, use the SAVE option specifying COM1 as the file name. On the PC, you would use the LOAD option from the Disk menu and the same file name--COM1.

Section 9-4: Foreign Files

You can share files with other programs besides Word Talk. Word Talk will send and receive standard ASCII text files using the import and export procedures.

In the last section, we used an IBM PC as an example of a personal computer with which interface can occur. However, let's assume that this time you don't have Word Talk on the PC. However, you do need a program that will send and receive files for the PC. Provided that you do, you would use the IMPORT option instead of the LOAD option on SMALL TALK's Tape menu. The IMPORT does not expect incoming text to be formatted as a Word Talk file. You may have to manually inform SMALL TALK when the transfer of text is complete, since Word Talk has no way of understanding how a foreign file might be terminated. Word Talk will look for a CTRL-Z to signal the end of the incoming file. If no CTRL-Z is encountered, SMALL TALK will just wait until you activate something. Press the BREAK key. SMALL TALK will then know that the transfer is over.

When you send a file from SMALL TALK without the Word Talk formatted information, use the Export option. When this option is used, a clean ASCII text file will be transmitted to the awaiting device. Exported files are also terminated with the CTRL-Z command to inform the receiving device that the transfer has been completed.

Remember we mentioned that spurious characters are occasionally generated when the RS-232C port is energized and de-energized. Turn the RS-232C port on before connecting to another machine, and turn it off after disconnecting.

SECTION 10: ADDITIONAL NOTES AND CONSIDERATIONS

Section 10-1: Escaping Menus

Occasionally you will go deep into the various menus of Word Talk. From the Main menu, for example, you can enter the Format menu. From the Format menu, you enter the Margins menu. The ESCAPE key will take you back to the beginning--one menu at a time. However, you can go directly back to the Main menu no matter how deep in menus you are. Use the COMMAND key (GRPH) in combination with the ESCAPE key. You can also exit the Editor this way.

Section 10-2: Prompts

All the information that Word Talk might require from you also has default values. When you want to change something, you type your own specification over the default that's been entered already.

However, sometimes the new number you're entering is a different number of characters than the default. For example, if the tape counter was set at 100 and you want to wind it back to 50, you would select the option from the Tape menu and type in the 50. However, the third digit from the default, or a previous value, is still there, and your 50 has really become a 500. To correct this situation, use the space bar to erase any following characters you don't want. You may also use the CTRL-E command to erase all characters to the right of the cursor.

PART 4: BASIC PROGRAMMING LANGUAGE AND SMALL TALK

SECTION 1: PROGRAMMING IN BASIC

Section 1-1: Introduction and Entering Basic

SMALL TALK is a fully programmable computer with microSoft BASIC in firm-
ware. You can write your own programs for SMALL TALK and make them talk.
If you are serious about using SMALL TALK and BASIC, it is recommended that
you read the Epson manuals that came with SMALL TALK. They have been pro-
vided for that purpose.

Before entering BASIC, press SMALL TALK's Reset button. The Reset button is
on the right edge of SMALL TALK, about one inch from the back edge. It is a
recessed button. Then go through the initialization procedure given in
Part I of this manual. From the System menu, type CTRL-B. Your screen will
appear like this:

> EPSON BASIC V-1.1
> Copyright 1982 by
> Microsoft & EPSON
> Pr: 65522 Bytes

Welcome to BASIC. There are two more preliminary steps to perform before you
can program. First enter the BASIC command LOGIN 2. Press RETURN after the
command. Finally, enter MEMSET 4100 and press RETURN again.

At this point, you're prepared to enter BASIC. The various entries just
made insure that important operating system memory areas are protected from
BASIC programs and variables. To maintain this protection, do not use the
BASIC TITLE command. Also, do not login, and use partition 1. If you have
a BASIC program already written and saved on tape, go ahead and load the
program and run it.

Section 1-2: Exiting BASIC

Every time you finish using BASIC, you should reset and reinitialize SMALL
TALK as you did when you were preparing to enter it. This is again necessary
to insure that SMALL TALK return correctly to normal operation.

Section 1-3: Addressing the Voice

BASIC programs can use SMALL TALK's built-in Voice Synthesizer. This is ac-
complished by installing a latch for the keyboard input and installing a second

latch for screen output. Run the following program at the beginning of your programs:

```
9000 REM THIS ROUTINE SETS UP THE SYNTH.
9010 POKE &H6BB,&H60
9015 POKE &H6BC,&H18
9020 POKE &H6C1,&H60
9025 POKE &H6C2,&H15
9030 POKE &H6A1,&H60
9035 POKE &H6A2,&H18
9040 POKE &H6A5,&HF
9045 POKE &H6A6,0
9050 FOR I=0 TO 11:READ A:POKE &HF00+I,A:NEXT
9055 OPEN"O",#1, "SCRN:"
9060 DATA &H86,&HD,&HBD,&H60,&H15,&HBD,&HA9,&H69,&HBD,&H60,&H12,&H39
9065 RETURN
```

After the above latching instructions have merged with the beginning of your program, all Basic statements that ask for keyboard input will provide a voice response for each key as it is typed.

To have output spoken, all that's necessary is to open a file for output assigned to the device named SCRN:, and print to this open file. The following program listing demonstrates this:

```
10 GOSUB 9000:REM SETUP SPEECH PARMS
20 MSG$="ENTER YOUR NAME:":GOSUB 1000
30 INPUT N$
40 MSG$="YOUR NAME IS "+N$:GOSUB 1000
50 END
1000 REM THIS ROUTINE WILL SPEAK AND PRINT MSG$
1010 PRINT MSG$
1015 PRINT #1,MSG$
1020 RETURN
```

It cannot be emphasized enough that using BASIC with SMALL TALK is easy <u>and</u> that it is easy if you read the Epson manuals.

SECTION 2: FILES AND BASIC

Section 2-1: Downloading Programs

This section will discuss sharing files between SMALL TALK and other computers as well as between Word Talk and BASIC within SMALL TALK. What do you do if you have BASIC programs on another computer that you want to use with SMALL TALK? You don't have to type and re-enter those programs on SMALL TALK; it is usually easier to transfer these programs using the RS-232C port. BASIC programs will be accepted by Word Talk as described in PART 3 of the manual--The Word Processor. Once a program file has been accepted by Word Talk, it may be exported to tape and read by BASIC. Due to the differences in the BASIC language from one computer to another, there may be some minor changes required by the programs transferred in this way. Once a program has been transferred to SMALL TALK and exported to tape, use the MERGE command from BASIC to begin using the program.

Again, consult the Epson manuals for detailed information on transferring programs between SMALL TALK and other computers.

When files are exported to tape by Word Talk, the name that you supply is converted automatically to all upper case characters. Furthermore, the extension ".TXT" is added to the end of the name by Word Talk. If you exported a program to tape and called it "Program," the name that you would need to use with the BASIC MERGE command is "PROGRAM.TXT".

If you use Word Talk as a program editor, remember that you will have to save BASIC programs as ASCII files. This is only necessary if you intend to load the program file into Word Talk. You can do this with the BASIC ",A" parameter after the name in the SAVE command. Use all upper case letters in the file name, because Word Talk expects all file names to be formatted that way.

APPENDIX A: Calculator and The Typewriter Keyboard

CALCULATOR FUNCTION   TYPEWRITER KEY

          DEG/RAD 1
          TANGENT 2
          COSINE 3
          SINE 4
          COMMON LOG . . . . Q
          NATURAL LOG . . . . W
          Y/X . . . . E
          SQUARE . . . . R
          MEM PLUS . . . . A
          MEM SWAP . . . . S
          MEM WRITE . . . . D
          MEM READ . . . . F
          INVERSE . . . . Z
          PERCENT X
          CLEAR MEMORY C
          CLEAR V
          7 7
          8 8
          9 9
          DIVIDE 0
          4 . . . . U
          5 I
          6 . . . . O
          TIMES . . . . P
          1 . . . . J
          2 . . . . K
          3 L
          MINUS . . . . ;
          0 . . . . M
          DECIMAL POINT . . . . ,
          TIMES/MINUS . . . .
          PLUS . . . . /
          EQUALS . . . . RETURN
          SCREEN REVIEW . . . . SPACE BAR
          PRINTER ON/OFF . . . . CTRL-P

APPENDIX B: PRINTER MAINTENANCE

SMALL TALK's built-in printer comes from the factory with the ribbon and paper already installed. (See Figure A-B-1) When you need to change paper or ribbon cartridges, follow the following procedures:

1) Remove the printer cover

2) Insert the paper roll

3) Insert the ribbon cartridge

4) Replace the printer cover.

There are no special tools required for these procedures. The printer cover is located two inches above the top row of the typewriter keyboard and has four small groves and the word "PUSH" embossed on it. Pushing down on the grooves snaps the cover up; at this point, simply lift the cover off the machine. (See Figure A-B-2)

With your thumb, lift up the hinged flap above the paper roll; it will flip back to reveal the paper roll and the paper roll's compartment. The compartment will accommodate approximately twenty feet of standard, 2 1/2" cash register paper. To load paper into the compartment, simply roll up about twenty feet of paper, place it in the compartment above the ribbon, and unroll several inches of paper as a leader. Slide the end of the leader through the slot connecting the paper compartment and the printer compartment. After you have slid through about 1/4" of paper, the paper will stop. Holding the paper in place, activate the Paper Feed mechanism. The printer will pull the paper into the compartment. Keep you finger on the Paper Feed mechanism, which is located directly above the BREAK key. When about an inch of paper has emerged, release the Paper Feed button and pull by hand about two inches. If you ever wish to remove the paper roll, simply lift the strip of ribbon. Close the Paper Compartment cover, being careful not to catch the end of the paper under the cover.

Eventually you will need to replace the ribbon cartridge. Remove the front printer cover as directed above. Press the word "PUSH" on the right side of the ribbon cartridge; the left side of the cartridge will flip up about one inch. You can remove it from that end.

To install a new one, place the right side (the side with the "PUSH" embossed on it) in the slot and be careful that the printer paper is led through the space between the ribbon and the plastic ribbon cartridge. Be sure that the printer paper is between the cartridge and the ribbon. Push the cartridge into the compartment, right side first, and press down. The top surface of the ribbon cartridge should be level with the metal plate in the ribbon compartment.

PUSH

PRINTER
OFF   ON

PAPER
FEED

Figure A-B-2

Cloth Ribbon
Beneath
Paper

EJECT   PUSH

Ribbon
Cartridge

PRINTER   PAPER
OFF   ON   FEED

Paper Feeder Switch
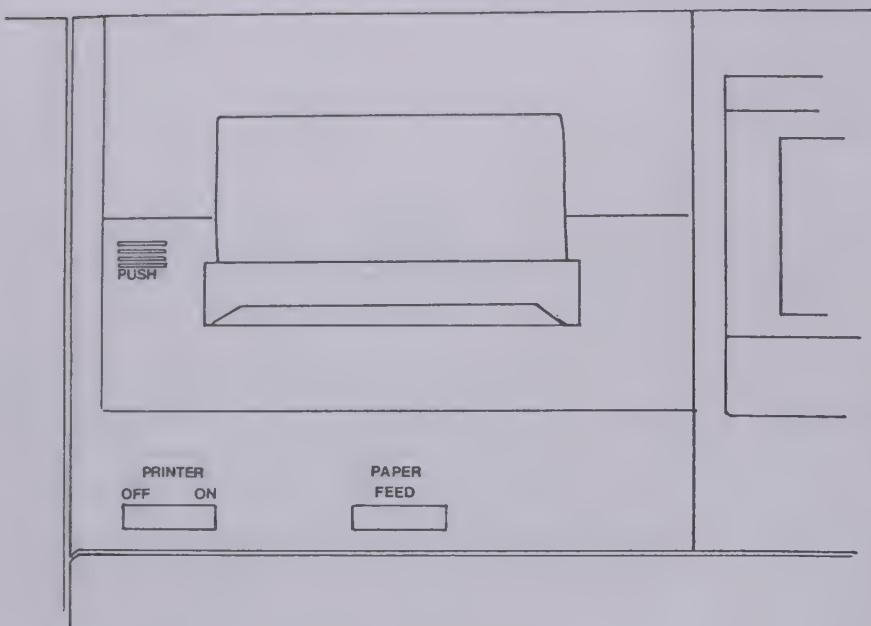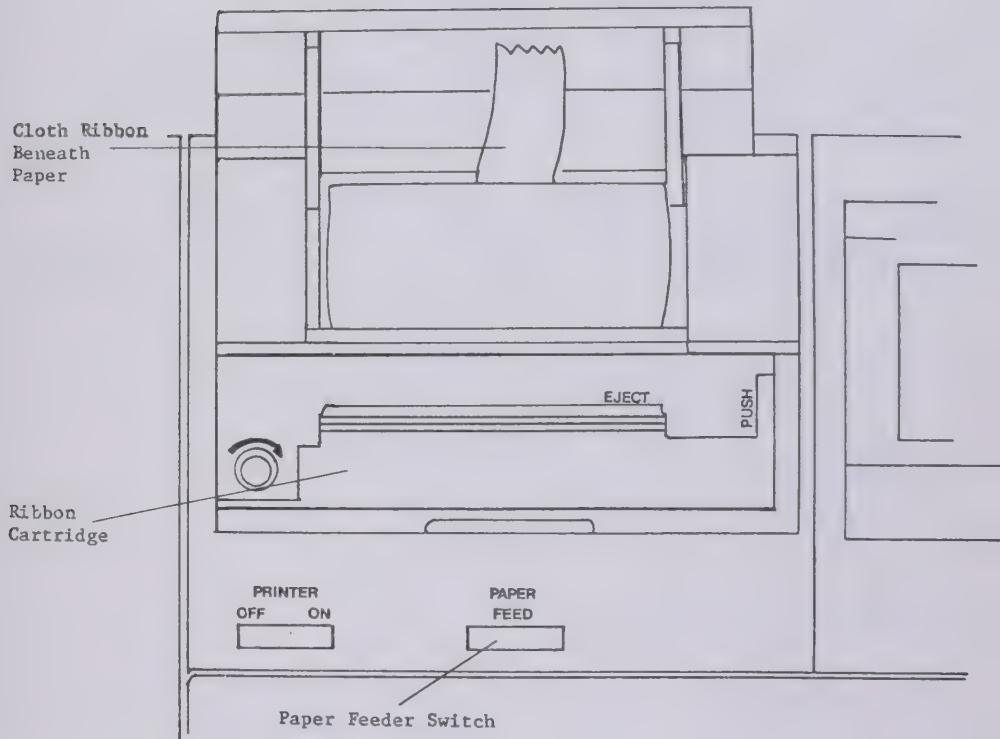
Do not be concerned if the ribbon has some slack and rests on top of the metal plate. That slack should be taken up when printing operations begin.

Replace the ribbon cover, being sure that the grooved lines and the embossed "PUSH" is to the upper left. This is the only way it will fit. Be sure the plastic cutting edge is facing up. Slide the paper lead through the clear plastic slot on the cover. Press the cover down into place.

If you accidentally get ribbon ink on SMALL TALK's surface, clean it off as quickly as possible. When the ink dries, it is difficult to remove.

Replacement ribbon cartridges are available from Epson and VTEK. They are not available yet at retail outlets. Write or call Epson or VTEK for replacement ribbon cartridges.

Printer tape is available from Epson or VTEK, but standard 2 1/4" printing tape or cash register tape will work perfectly. If you have a large roll of tape, cut off about 20 feet and roll it in order to insert it into the printer's tape compartment. The compartment will accommodate about 20 feet of tape and no more.

APPENDIX C: ERROR MESSAGES

Section C-1: Word Talk Errors

The following lists the reasons for error messages from Word Talk:

1) BLOCK NOT MARKED - Occurs when the copy or delete options are selected from the Block menu when no mark has been placed in the text.

2) MEMORY IS ABOUT FULL - Occurs when there are only 2000 characters available for typing into Word Talk's memory. At this point, you should begin to brng the document to a close and save the file.

3) MEMORY IS FULL - Text area is full. Only deletions and moving around in the text is allowed at this point.

4) EMPTY BLOCK BUFFER - This message indicates that no text is present in the block buffer. A block copy or delete must be done before writing is allowed.

5) COLUMN WIDTH IS TOO LARGE - This error occurs when loading a file from another Word Talk and the margin settings on that file are greater than 80 columns.

6) FILE TOO LARGE - This error indicates that the file which is being loaded from another Word Talk is too large for SMALL TALK.

7) DATA LOST DURING TRANSFER - Indicates that some portion of the formatted Word Talk file was lost during a transfer. Send the file again.

8) ILLEGAL FORMAT SETTING - Indicates that margin or other format settings are invalid. Check the values for crossed margins or other illegal formatting settings.

9) ERROR SETTING COUNTER - Unable to set the cassette to the indicated value.

10) CAN'T MERGE FROM COM PORT - Merges are not allowed through COM1. If data transfer through the COM port is desired, the LOAD or IMPORT option must be used.

11) ILLEGAL FILE NAME - Indicates that the name of the file begins with a space. Word Talk does not allow a space as the first character of a file name, so attempt the operation again without a space.

12) CASSETTE NOT MOUNTED - An attempt was made to save to or load from tape when no cassette drive was present.

13) NO CASSETTE IN DRIVE - Place cassette in drive and try the save again.

14) PARITY ERROR - Bad parity (check) value was detected during data transfer. Try the transfer again.

15) ERROR XXX HAS OCCURRED (where XXX is an error code) - The error indicated by the XXX value has occurred. Con- your dealer.

Section C-2: Calc-Talk Errors

The error messsages possible during use of Calc-Talk are:

1) OVERFLOW - Indicates that an overflow situation was encountered when an operation was attempted.

2) DIVIDED BY ZERO - Indicates that division by zero was attempted.

3) UNDEFINED - Indicates that the operation indicated has an undefined result.

APPENDIX D: REFERENCE CARD

CONTROL COMMANDS

CTRL-A   ADDRESS voiced as Cx, Ly, Pz

CTRL-B   BUMPS line open one space at current location of cursor

CTRL-C   CUTS text open at current cursor location for insertion

CTRL-D   DELETES current line of text

CTRL-E   ERASES text from current cursor position to end of line

CTRL-F   FINDS next occurrence of target string

CTRL-G   GOES to position specified as Cx, Ly, or Pz

CTRL-H   Homerow equivalent of Left Arrow key

CTRL-J   Homerow equivalent of Down Arrow key

CTRL-K   Homerow equivalent of Up Arrow key

CTRL-L   LINE voiced without moving cursor

CTRL-N   INSERTS blank line at current line location

CTRL-O   OPTIONS available using the CTRL key listed

CTRL-P   PASTES text together from current location of cursor to paragraph end

CTRL-R   REPLACES located target string with replacement string

CTRL-S   Virtual SCREEN voiced without moving cursor

CTRL-T   TABS to last character of current line

CTRL-U   Homerow equivalent of Right Arrow key

CTRL-W   Centers current line within defined margin setting

CTRL-X   Silences voice momentarily until next keystroke

CTRL-Y   Tabs to first character of current line

CTRL-Z   ZAPS keyboard buffer clear

See specific text sections for inverse commands.

APPENDIX E: SMALL TALK APPLICATIONS

Section E-1: SMALL TALK NOTES

SERIAL PORT:

SMALL TALK does not support the Serial Port (5 Pin DIN). Serial port is for the connection of disk drives. Disk drives are not supported by SMALL TALK because there is no room in SMALL TALK's firmware and they are also expensive. This port does not support hand-shaking.

SPEAKER:

SMALL TALK's sound comes through a speaker in the expansion unit. Word Talk and Calc Talk do not support the internal HX-20 Epson speaker. Through BASIC and special programming, you can use the Epson speaker and get sound effects.

COLUMN WIDTH:

SMALL TALK can support column width to maximum of 80 columns.

IMPORT/EXPORT:

When Importing and Exporting, start with IMPORT first. You want IMPORT ready and waiting when EXPORT begins.

FILE TRANSFER:

SMALL TALK cannot go directly to AppleWriter, AppleWorks, or WordStar. Those programs cannot be on-line to a serial port for file transfer. You need to go through Word Talk or Braille Edit first to create a text file. This is a file format which Apple Writer/Apple Works or WordStar can recognize.

AppleWriter, AppleWorks, or WordStar can send files to SMALL TALK because they consider SMALL TALK as an external serial device. Therefore, you can send files from these programs directly to SMALL TALK.

WORD TALK (Apple):

Word Talk (Apple) Version 2.X or greater is needed to support serial file transfer. Earlier versions cannot support serial file transfer and need updating through Computer Aids Corporation.

BARCODE and MIKE PORTS:

Barcode and mike ports are not supported.

Section E-2: SMALL TALK ACCESSORIES

Tapes:

C30 CrO_2 microcassette tapes

90K storage capacity per C30 tape

Epson, Radio Shack, Sony, Memorex--some microcassette manufacturers found in local computer supply, convenience, office supply, drug, discount, and department stores

Data cassettes are advisable for storage of computer data files.

NOTE: Do not use metal tape.

Volume: Print Page--   80 columns by 56 rows = 20 per 30 minutes
                                                40 per 60 minutes

        Braille Page--   40 columns by 25 rows = 90 per 30 minutes
                                                180 per 60 minutes

Earphone Jack:

1) Standard audio earphone can be connected. Connect earphone jack to left side panel of SMALL TALK near left front corner. Use 1/8" earphone such as one received with your tape recorder, radio, or television.

2) Mouser Crystal Earphone with 1/8" plug and 2K-10K impedance is Stock No. 25CRO35.

   Mouser Dynamic Earphone with 1/8" plug and 1K impedance is Stock No. 25DE039.

   Consult this distributor for ordering and pricing:

   Mouser Electronics
   P.O. Box 9003
   Lakeside, CA 92040
   (619) 449-2222 (817) 483-4422 (Texas Distribution Center)

3) Radio Shack Mono Earphone; Catalog #33-177, Page 31 of 1986 Catalog

Headphones:

Headphones must be used in their MONO mode. Stereo headphones which do not supply a STEREO/MONO switch must be used with an adapter attached to its cable before inserted into the SMALL TALK earphone jack.

This adapter is found on Page 129 of the 1986 Radio Shack Catalog, No. 274-368 and costs $1.19.

Headphones continued:

1) Toshiba HR-MV1 Stereo Headphones (included with Toshiba Stereo Cas-
   sette Model KT-VS-1). Use with mono cable adapter.

2) Sony Stereo Headphone MDR-A30L (approximately $30) has MONO/STEREO
   switch.

   Manufacturer: Innovative Rehabilitation Technology Inc.
                 26699 Snell Lane
                 Los Altos Hills, CA 94022
                 (415) 948-8588

3) Radio Shack sells a variety of headphones. Be certain that the one
   you choose has the mono capability and a 1/4" plug. Adapters can be
   used whenever necessary.

   Consult your local store or use their catalog for information.

Speakers:

External speakers may be used when attached to the Earphone jack. It is
advisable to keep your Smart Charger handy; an external speaker will
drain the rechargeble batteries quickly. However, an external speaker
is very effective for classroom instruction or group presentations.

Radio Shack, Bose, Aiwa, and JBL are some speaker manufacturers whose
products are found in audio, computer supply, discount, and department
stores.

We have used the following speaker and cable purchased from a Radio Shack
Retail Store:

1) Realistic Speaker Model Minimus-18, Catalog No. 40-222 (Page 21 of 1986
   Catalog).

2) Mini Plug-to-Lug Cable, 1/8" Mini Phone Plug with 12 ft. 24 gauge
   cable, Catalog No. 42-2454; Page 24 of 1986 Catalog.

Section E-3: SMALL TALK AND THE EPSON MANUALS

Basic Tutorial and Reference Manual

    Volume I   Tutorial
    Volume II Reference

    Both manuals relevant to writing your own BASIC programs.

Operations Manual – Microcassette Drive

    Chapters 1, 2, 3, 5, and 6 are relevant to the SMALL TALK System

    Chapter 4 should be disregarded as it is not applicable to SMALL TALK

Operations Manual – Notebook Computer

    Chapter 3, pages 15-23, should be referred to regarding the micro-
    printer. Paper insertion and printer ribbon replacing are discussed
    here.

    Pages 68-69, Section titled Communications RS-232C, Pin Assignment
    refers to pin assignment of this 8 pin DIN conection. In making an
    interface cable, this pin assignment is necessary for the SMALL TALK
    side of the interface.

Section E-4: SMALL TALK TO MBOSS-1S

Test Configuration

Equipment:

    1) MBOSS-1S
    2) SMALL TALK with VTEK's C232 Interface Cable

Serial Settings:

    4800 Baud
       8 Data Bits
       1 Stop Bit
       No Parity

MBOSS-1S

SW 40		SW 41	
1	Closed	1	Closed
2	Open	2	Open
3	Open	3	Open
4	Closed	4	Closed
5	Open	5	Closed
6	Closed	6	Open
7	Open	7	Open
8	Open	8	Open
		9	Open
		10	Open

SMALL TALK Commnication Function Keys:

    Function 1 = 4800 Baud
         2 = No Parity
         3 = 1 Data Bit
         4 = 1 Stop Bit

Cable used is Epson's Grey Cable #715.

RS232 Port ON (Printer ON/Off Switch = ON)

SMALL TALK Procedures to Print to External Printer:

Set up your file format to print to an external printer--the MBOSS-1S. The
MBOSS-1S recognizes a 40 column line and 27 lines per page.

Test Configuration

Equipment:

    1) IBM PC with Async Card and Word Talk
    2) SMALL TALK
    3) Interface Card

Serial Setting:

    4800 Baud
    8 Data Bits
    1 Stop Bit
    No Parity

IBM Serial Card Configuration:

    From DOS prompt, type MODE COM X:48,N,8,1

SMALL TALK Communication Function Keys:

    Function 1 = 4800 Baud
          2 =   8 Data Bits
          3 = No parity
          4 = 1 Stop Bit

Cable Configuration:

    IBM (DB25)   SMALL TALK (8 Pin DIN)

```
        1 - - - - - - - 1

        2 - - - - - - - 3

        3 - - - - - - - 2

        5 --|         |-- 5

        6 --|         |-- 6

        8 --|         |-- 7

       20 --|         |-- 8
```

RS 232 Port ON (Printer On/Off Switch ON)

Equipment:
    1) Apple IIe with Super Serial Card and Word Talk or Braille Edit
    2) SMALL TALK with VTEK's C232 Interface Cable

Serial Setting: 4800 Baud
                  8 Data Bits
                  1 Stop Bit
                  No Parity

Apple Super Serial Card Switch Settings:
    Jumper Block pointing up--towards <u>Modem</u>

          SW 1:   1 Off   SW 2:   1 On
                   2 Off   2 On
                   3 On   3 On
                   4 On   4 On
                   5 On   5 On
                   6 On   6 Off
                   7 On   7 Off

SMALL TALK Communication Function Keys:
    Function 1 = 4800 Baud
             2 = No Parity
             3 = 8 Data Bits
             4 = 1 Stop Bit

    RS232 Port ON (Printer On/Off Switch = On)

    Cable used is Epson's grey cable #715

Cable Configuration:
        Apple (DB25)   SMALL TALK (8 Pin Din)

          1 - - - - - - - - - - - Case

          2 - - - - - - - - - - - 3

          3 - - - - - - - - - - - 2

          4--|
             | - - - - - - - - - - 8
          5--|

          6 - - - - - - - - - - - 7

          7 - - - - - - - - - - - 1

          8 - - - - - - - - - |-- 4
                                |-- 5

         20 - - - - - - - - - - - 6

          7 - - - - - - - - - - - 1
                                 |-- 4
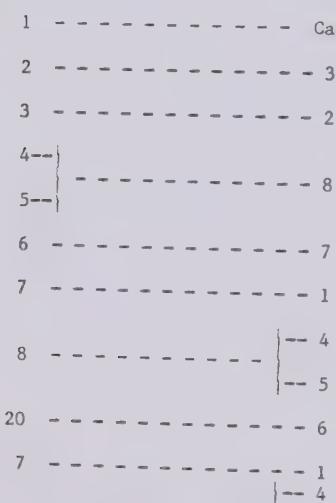
Section E-7: SMALL TALK to APPLE IIe

Test Configuration (Alternate)

Equipment:

    1) Apple IIe with Super Serial Card and Word Talk or Braille Edit.
    2) SMALL TALK with Epson's 706 Interface Cable

Serial Setting:

    4800 Baud
        8 Data Bits
        1 Stop Bit
          No Parity

Apple Super Serial Card Switch Settings:

    Jumper block pointing down toward **Terminal**

SW1		SW2	
1	Off	1	On
2	Off	2	Off
3	On	3	Off
4	On	4	On
5	Off	5	On
6	On	6	Off
7	On	7	Off

SMALL TALK Communication Function Keys:

    Function 1 = 4800 Baud
             2 = No Parity
             3 = 8 Data Bits
             4 = 1 Stop Bit

Cable used is Epson's black cable #706 (straight cable)

RS-232 Port ON (Printer ON/Off Switch--On)

Section E-8: SMALL TALK to APPLE IMAGEWRITER

Test Configuration

Equipment:

    1) Apple Imagewriter Serial Inkprint Printer
    2) SMALL TALK with VTEK C232 Interface Cable

Serial Settings:

    2400 Baud
    8 Data Bits
    1 Stop Bit
    No Parity

Apple Imagewriter

SW1		SW2	
1	Open	1	Open
2	Open	2	Closed
3	Open	3	Open
4	Open	4	Open
5	Closed		
6	Closed		
7	Open		
8	Open		

SMALL TALK Communication Function Keys:

    Function 1 = 4800 Baud
             2 = No parity
             3 = 8 Data Bits
             4 = 1 Stop Bit

Cable used Epson Grey Cable #715

RS-232 Port ON (Printer On/Off Switch = ON)

SMALL TALK Procedures to Print to External Printer:

    Set up your file format in order to print to an external printer which
    will be the Apple Imagewriter. The page format will be for a dot matrix
    printer printing 12 characters per inch. This format will provide one
    inch margins on all four sides of the printed page.

Section E-9: SMALL TALK to KURZWEIL READING MACHINE (KRM)

Model III with Version 4.00 Software
Model IV with Version 4.1 Software

Cable used -- SMALL TALK to DCE device + break-out box
    Pins 1, 2, 3, and 7 go straight through
    Pins 5, 6, 8, and 20 were tied together

SMALL TALK requires handshaking and the KRM uses no handshaking. The machines
can communicate together but cannot tell each other when their buffers are
filled. S/W handshakes cannot be used in this situation; therefore, you must
estimate when data must be saved in order to keep from losing it.

Model IV -- configured from Keyboard:

    1) BAUD 4800 = Press SET, SPECIAL command, 60, number, number, number,
       number, 4800.

Model III -- configured by DIP switches inside computer. Make sure port is
             turned on.

                SMALL TALK Baud = 4800
                            No Parity
                            8 Data Bits
                            1 Stop Bit

Send SMALL TALK file to KRM:

1) Set Special Command to 40 on KRM and press page key
2) Load SMALL TALK file into memory.
3) Type E (Extras from Tape Menu)
4) Type E (Export)
5) Type COM1(C/R) <file menu>

Send KRM file to SMALL TALK:

1) Type E (Extras from Tape Menu)
2) Type I (Import)
3) Type COM1 (C/R) <file name>
4) Set Special Command to 45 on KRM

This information is reported by a current user of both SMALL TALK and the KRM.
VTEK was unable to test this configuration and procedure.

January, 1986

Current version of SMALL TALK is as follows:

Operating System = Version 1.1

Work Talk   = Version 2.3

Calc Talk   = Version 1.0

Text to Speech   = SSI 263 Chip   8433 or greater

Problems with earlier versions are that the unit hangs up, the speech stops, it speaks continuously, or documents in RAM are lost.

SSI 263 Speech Chip of 8410 is defective.   Series 8433 or greater are good speech chips.

If unit hangs up, check in expansion unit for SW1.   It should be in the ON position.

Section E-11: SMALL TALK AND BASIC MODE

Init SMALL TALK by pressing CTRL-@ or RESET button (This erases RAM).

1. Type CTRL-B
2. LOGIN 2 (C/R)
3. MEMSET 4100 (C/R)

This cuts off the section in SMALL TALK RAM where speech programs reside. This is a safety precaution necessary so your BASIC programs DO NOT override the special speech programs.

This status persists until you re-INIT the memory. You can power off and power on and this stays in RAM.

To successfully exit this mode and return to Word Talk or Calc Talk, you need to either press RESET or turn off SMALL TALK and turn on and reinitialize with CTRL-@.

CAUTION: DO NOT PRESS MENU KEY WHILE IN BASIC. PRESSING MENU FUNCTION KEY
           WILL KILL THE SPEECH BECAUSE IT PUTS THE SMALL TALK IN THE HX 20
           OPERATIONS MODE. THE SPEECH WILL LOCK UP.

When storing BASIC programs, file names should be in all caps.

Pressing the CTRL + ON/OFF (Function Key) produces a dump to the microprinter.

The BASIC Program included in SMALL TALK's User's Manual on page 4-1-2 will provide speech during keystroke entry when encountering prompts from a BASIC program. This version of BASIC does not speak operating system level prompts because they are routed directly to screen and cannot be spoken.

Screen review functions work in Word Talk or Calc Talk only. The reason is that they are written in 6301 Assembly Language. During the execution of the program, you will not get speech.

Vendor: Computer Access For The Blind
          Attn: Mindy Fliegelman
          135 West 23rd. St. #302
          New York, NY 10011

          (212) 255-6688

Program: RECEIPTS ($100.00)

          Prints out customer receipts with date, company name, address and
          phone number, items purchased by part number and price, and total
          amount of sale.

          Tracks 100 part numbers with prices and quantity on hand.

          When receipt is being printed, deletes items from inventory.

          Prints two reports:

               1) Inventory on hand and price

               2) Daily sales figures

          Prints reports to microprinter, saved to microcassette, or spoken
          from screen.

          End of Day—updates inventory.

          All SMALL TALK speech options are available to user when using this
          program.

          Availability: March 1, 1986

Section E-13: WORD TALK MAIN MENU

1. Type F (for Format)

   Format Menu

1. Type L (for setting line length)
2. Type 66 (C/R) <Carriage Return>
3. Type M (for setting margins)
4. Type L (for left margin)
5. Type 12(C/R) <for one inch left margin>
6. Type R (for right margin)
7. Type 9Ø(C/R) <for one inch right margin>
8. Type T (for top margin)
9. Type 6(C/R) <for one inch top margin>
10. Type B (for bottom margin)
11. Type 6Ø(C/R) <for one inch bottom margin>
12. Press Escape Key (to return to Format Menu)
13. Type S (for line spacing)
14. Type S(C/R) <for single spaced page)
15. Press Escape Key (to return to Format Menu)
16. Press Escape Key (to return to Main Menu)

   Word Talk Main Menu

1. Type P (for Print)
2. Type D (for Device)
3. Type E (for printing to external device)
4. Press Escape Key (to return to Print Menu)
5. Press G (to begin printing)

SMALL TALK remembers these format commands and saves them to tape as well as
the text of your file. When the file is reloaded from microcassette, SMALL
TALK retains the original format.

Word Talk Main Menu

1. Type F (for FORMAT)

   FORMAT MENU

1. Type L <for length>
2. Type 27 (C/R) <Carriage Return>
3. Type M <for margins>
4. Type R <for right margin>
5. Type 4∅ (C/R)
6. Type B <for bottom margin>
7. Type 27 (C/R)
8. Press Escape Key (to return to Format Menu)
9. Press Escape Key (to return to Main Menu)

Word Talk Main Menu

1. Type P (for Print)
2. Type D (for Device)
3. Type E (for printing to external device)
4. Press Escape Key (to return to Print Menu)
5. Press G (to begin printing)

SMALL TALK remembers these format commands and saves them to tape with the text of your file. When the file is reloaded from microcassette, SMALL TALK retains the original format.

Word-Talk TECHNICAL NOTE #1

Errors in version 2.0 (September 10, 1985)

In version 2.0 of Word-Talk, the INIT TABS option from the Tab Menu has a bug.
When the tabs were cleared, the routine went one byte too far and also cleared
the first character of the text. This caused unpredictable results!

The following patch was required to correct this problem:

```
TABS_CLEAR        PROC
                  LDX       #TAB_SET_BEG
        :LOOP     CLR       X
                  INX
                  CPX       #DATA_START-1
                  BLS       :LOOP
                  RTS
```

The version of Word-Talk after this patch is now 2.1.

Word-Talk TECHNICAL NOTE #4

Errors in version 2.2 (November 7, 1985)

In version 2.2 of Word-Talk, there was a bug in the block functions. The bug
was when the user tried to place a mark on the first character of a blank line.
This caused very unpredictable, weird results. Version 2.3 has corrected this
problem.

Also during the update to version 2.3, the feature of not reformatting the
text during an import if each line in the document fit withing the margins
was added. If one or more lines of text are outside the current margin
settings, then the entire document is reformatted to the margins.

The new version is now version 2.3.

Text-To-Speech TECHNICAL NOTE #1

Errors in version 1.0 (September 4, 1985)

In version 1.0 of the TTS, there was a bug in the second pass of translation.
If the rule [ ]=; was encountered, then in procedure 'MATCH' the carry would be
set upon return to indicate a match. This is all good but if there were a
match, then DATA_PTR and DATA_END_PTR should never be the same. MATCH left
them the same and this caused an infinite loop because MATCH would always be
called to find a match for the same character. The following fix was added:

```
                    :GOT_IT          STX        RULE_DATA_PTR
        *
        *          THE FOLLOWING FOUR LINES ARE THE PATCH REQUIRED.
        *
                                     LDX        DATA_PTR
                                     CPX        DATA_END_PTR
                                     BNE        :ALL_DONE
                                     INX
                                     STX        DATA_END_PTR
        *
        :ALL_DONE                    SEC
                                     RTS
```

NOTE: The rule []=; should actually never be needed. However, if a rule were
      typed incorrectly with a character that does not exist during Pass 2, then
      it keeps the program from blowing up. This error was discovered because
      the rule for YOUNG was typed as follows:

                              '[YOUNG]=$xJ;'

      As can be seen, 'J' is not defined during Pass 2. It should have been 'j'.
This rule was corrected along with the above patch as well as some additional
rules for better translation.

The version for the TTS is now 1.1.

Section E-15: HX-2∅ DIN CABLE TERMINATOR

The following graphic shows the pinout of the DIN termination of the Epson
cables as seen looking into the cable terminator.

HX-2∅ RS-232C DIN PINOUT

```
          ....    ....
          |___ |

     *              *
     6              7

 *                      *
   1                      3    <--------SHELL
          *
          8
 *                      *
   4                      5
          *
          2
```


SIGNAL ASSIGNMENTS

1: SIG. GND

2: TxD

3: Rxd

4: RTS

5: CTS

6: DSR

7: DTR

8: CD

SHELL: CHASSIS GROUND

APPENDIX F: REMOVAL AND INSERTION OF PRINTER PAPER AND RIBBON

Immediately to the left of the printer's clear plastic bar is a small grooved area, about 1/4" by 1/4". Pressing down on this grooved area "snaps" up the plastic piece for easy removal. Try it. The front edge should "snap" up about 1/8" and you can easily lift it out, revealing the print er mechanism beneath. The now exposed area (approximately 1" by 4") contains the printer ribbon which also snaps out. The right side of the ribbon cartridge has the word "eject" along the top, right edge and the word "push" written vertically along the right edge. Push down where it says "push" and the left side of the cartridge snaps up and may be easily removed and, of course, replaced. The left side of the ribbon cartridge has a grooved wheel which may be turned clockwise in order to advance and tighten the ribbon in the cartridge. During SMALL TALK's operation, the ribbon advances automatically. If you have not done so already, snap out the plastic protective covering with the clear plastic bar and remove the ribbon cartridge. Then replace them. They snap easily back into place. When you replace the cartridge, be sure that you have fed the printer paper leader through the cartridge, between the plastic cartridge and the ribbon. Similarly, be certain that the printer paper feeds between the clear plastic viewing bar and the back of the plastic protective cover. Slide the back edge in first and then snap the front down.

Directly behind the paper feed is a raised surface that snaps open, revealing the paper roll inside. With your thumbnail, find the center groove directly behind the paper and push in a direction away from you, toward the back of SMALL TALK. The hinged cover should open, revealing a compartment where the unused paper roll is stored. Unroll about three inches of paper and slide the paper leader through the slot connecting the paper compartment and the printer compartment. About 1/4" of the paper will feed in before it must be taken up by the paper feed. Holding the paper in place, being certain that that 1/4" has fed as far into the slot as possible, press the Paper Feed switch. The paper will feed as long as you hold the seitch down. When the paper has emerged from the top of the printer, release the button. At this point, you can pull the paper slowly, but firmly, by hand. Close both compartments, and be sure that the paper has slid through the opening of the clear plastic cover.

VTEK LIMITED WARRANTY,

INCLUDING EXTENSIONS AND EQUIPMENT REPLACEMENT OPTIONS

All VTEK Products are guaranteed by VTEK, to the original purchaser, to be free from defects in material or workmanship. The duration of the guaranty may vary from product to product, and is defined in product literature for each product or series of products. This warranty excludes fuses, bulbs, and similar replaceable items, and does not cover incidental or consequential damages. In the case of any agency, organization, or institution purchasing VTEK equipment, the warranty is for the benefit of any client or student of the purchasing organization, even if title to the equipment has technically been transferred.

If the equipment is delivered for use outside the United States or Canada, it is similarly warranted if sold directly by VTEK for use in a country where VTEK does not currently have a local distributor or dealer. Where there are local distributors or dealers, they will normally provide a comparable warranty which is not a warranty from VTEK itself; consult your local distributor or dealer for specific information as to your local warranty in countries other than the United States and Canada.

This warranty does not cover damage caused by improper use of VTEK products, for purposes for which the product was not designed, nor damage caused by fire, accident, neglect, water damage, or other cause not relating to VTEK's design or production of the product.

Unless otherwise agreed in writing, this warranty is a "FACTORY WARRANTY," which requires that defective items must be returned to VTEK's factory, or to the nearest authorized service center, with transportation charges prepaid by the user. Users are required to contact VTEK or their nearest service center by paid phone call prior to returning equipment for repair, since many apparent defects may be solely the result of improper adjustment, and repair or readjustment may be possible without return to the service center. The Service Manager will issue a RETURN AUTHORIZATION NUMBER, which is mandatory for all items returned to the Factory for repair.

VTEK'S FACTORY SERVICE DEPARTMENT WILL NOT ACCEPT EQUIPMENT RETURNED FOR REPAIR UNLESS A "RETURN AUTHORIZATION NUMBER" WAS ISSUED PRIOR TO THE SHIPMENT.

Items returned for repair must be packed securely, and should be insured by the user against damage in transit. VTEK does not assume responsibility for damage occurring in transit. It is your responsibility to pack equipment securely. VTEK will provide extra sets of original packing materials on request, subject to a modest charge.

For some products, VTEK also offers an "extended warranty" or "extended service agreement," which would be described using those words on an invoice. Any such agreement also refers to this warranty statement, and simply extends the duration of the warranty; all the terms and provisions of this statement continue to apply.

For some products, VTEK also offers a "guaranteed 24-hour replacement policy," which would be described using those words on an invoice. Any such agreement

provides that VTEK will ship a replacement part, or the entire product if VTEK
deems that necessary to properly meet your needs, by the end of the next busi-
ness day following notification to VTEK, all charges paid by VTEK. In such a
case, the replacement part or product which you receive is yours to keep (it
may be a rebuilt used part or product). As soon as you receive it and verify
that everything is working OK, you must return the original defective part or
product to VTEK at your expense.

No modification to, or extension of, this warranty may be made except in writing
by a duly authorized officer of VTEK. This warranty may be voided if equipment
is altered or repaired other than by VTEK or persons authorized or certified by
VTEK to make such alteration and repairs.

APPENDIX H

SERVICE POLICY

Users are required to contact VTEK by paid phone call prior to returning equipment for repair, since many apparent defects may be due to improper connections, switch settings, or particular uses of the equipment. In these cases, repairs or readjustments may be accomplished without return to the factory. The Service Manager will issue a RETURN AUTHORIZATION NUMBER, which is mandatory for all items returned to the Factory for repair.

VTEK'S FACTORY SERVICE DEPARTMENT WILL NOT ACCEPT EQUIPMENT RETURNED FOR RE-PAIR UNLESS A "RETURN AUTHORIZATION NUMBER" WAS ISSUED PRIOR TO THE SHIPMENT.

Items returned for repair must be packed securely and should be insured by the user against damage in transit. VTEK does not assume responsibility for damage occurring in transit. It is your responsibility to pack equipment securely; we will provide assistance and advice by phone, or through our local representative, as required. VTEK will provide extra sets of original packing materials on request, subject to a modest charge.

The address and phone number for service-related inquiries, whether equipment is in or out of warranty, is:

VTEK Service Department   Service Hotline:
5308 West 145th. Street
Lawndale, CA 90260   (213) 644-1724
(213) 536-0992; 536-0995

EQUIPMENT RETURN NOTICE

DATE:

RETURN AUTHORIZATION NUMBER: RA#

THIS FORM, INCLUDING RETURN AUTHORIZATION NUMBER, MUST ACCOMPANY ALL EQUIPMENT RETURNED FOR SERVICE. IF A SEPARATE LETTER HAS BEEN SENT REGARDING THIS EQUIPMENT, PLEASE BE SURE THAT A COPY OF THAT LETTER IS ALSO ATTACHED TO THIS FORM.

DESCRIBE EQUIPMENT (INCLUDE SERIAL NUMBER FOR EACH ITEM RETURNED):

USER (FULL NAME/ADDRESS/PHONE): #1

BEING RETURNED BY (INCLUDE PHONE): #2

ORIGINAL VTEK ORDER NUMBER:
(IF KNOWN) _____

AFTER REPAIR, RESHIP TO:
( ) USER, #1 ABOVE
( ) #2 ABOVE
( ) OTHER; NAME: _____
ADDRESS: _____
CITY, STATE: _____
ZIP CODE: _____

IS SERVICE ( ) NON-BILLABLE (WARRANTY, OR UNDER SERVICE AGREEMENT)
( ) BILLABLE (OUT OF WARRANTY, OR USER-CAUSED DAMAGE)

IF BILLABLE: YOU MUST TELL US IN THIS SPACE WHO WILL BE RESPONSIBLE FOR PAYMENT, WHETHER OR NOT WE ARE TO PROVIDE AN ESTIMATE BEFORE DOING ANY WORK, AND WHETHER OR NOT ANY SPECIAL BILLING FORMS MUST BE USED.

DESCRIBE NATURE OF PROBLEM OR DAMAGE AS COMPLETELY AS POSSIBLE. PLEASE TYPE OR PRINT LEGIBLY. USE ADDITIONAL SHEETS OF PAPER IF NECESSARY. BE SPECIFIC.

VTEK SERVICE DEPT., 4955 WEST 145TH ST., HAWTHORNE, CA 90250 (213) 978-8835